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A Revision of the Tribe Scaphytopini (*Homoptera*, *Cicadellidae*) in America North of Mexico

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ABSTRACT: The following genera and subgenera of *Cicadellidae* in America north of México are revised: *Platymetopius*, *Japananus*, *Scaphytopius*, *Cloanthanus*, *Tumeus* and *Vertanus*. Keys to genera, subgenera, species and subspecies are included, as well as prints of male genitalia and last ventral segment of the females. Discusses 73 species and subspecies. Synonyms considered are as follows: *Cloanthanus* Ball = (*Deltopinus* Ball = *Convelinus* Ball = *Nasutoideus* Ball = *Platymoideus* Ball); *Japananus hyalinus* (Osborn) = (*Platymetopius cinctus* Matsumura); *Scaphytopius* (*Scaphytopius*) *elegans* (Van Duzee) = (*Scaphytopius elegans* var. *glennanus* Ball = *Scaphytopius floridanus* Ball = *Scaphytopius floridanus* var. *glennanus* Ball); *Scaphytopius* (*Cloanthanus*) *fuscifrons* (Van Duzee) = (*Platymetopius abruptus* Ball); *Scaphytopius* (*Cloanthanus*) *dorsalis* (Ball) = (*Platymetopius bicolor* DeLong); *Scaphytopius* (*Cloanthanus*) *magdalensis* (Provancher) = (*Platymetopius obscurus* Osborn = *Platymetopius carolinus* Lathrop = *Cloanthanus atratus* DeLong = *Cloanthanus vaccinium* DeLong); *Scaphytopius* (*Cloanthanus*) *scriptus* (Ball) = (*Cloanthanus varius* DeLong); *Scaphytopius* (*Cloanthanus*) *cinereus* (Osborn and Ball) = (*Platymetopius parvus* Lathrop = *Platymoideus oviedus* Ball); *Scaphytopius* (*Cloanthanus*) *acutus* (Say) = (*Jasus modestus* Stal = *Platymetopius acutus* var. *dubius* Van Duzee = *Cloanthanus filamentus* DeLong = *Cloanthanus tenuis* DeLong); *Scaphytopius* (*Cloanthanus*) *latus* (Baker) = (*Platymetopius cuprescens* Osborn); *Scaphytopius* (*Cloanthanus*) *argutus* DeLong = (*Scaphytopius hastus* DeLong = *Scaphytopius lanceus* DeLong); *Scaphytopius* (*Cloanthanus*) *trilineatus* (Ball) = *Platymetopius pexatus* (Van Duzee); *Scaphytopius* (*Cloanthanus*) *abbreviatus* (DeLong) = (*Cloanthanus parvus* var. *niger* DeLong). *Cloanthanus* and *Tumeus* are reduced to subgenera of *Scaphytopius*. *Hebenarus huachucae* Delong is placed in the subgenus *Scaphytopius*. Both lectotype and lectoallotype are designated for the following species: *Japananus hyalinus* (Osborn), *Scaphytopius* (*Cloanthanus*) *nigricollis* (Ball), *Scaphytopius* (*Cloanthanus*) *fulvus* (Osborn), *Scaphytopius* (*Cloanthanus*) *fulvus collaris* (Sanders and DeLong), *Scaphytopius* (*Cloanthanus*) *cinnamomeus* (Osborn), *Scaphytopius* (*Cloanthanus*) *angustatus* (Osborn), *Scaphytopius* (*Cloanthanus*) *nigriviridis* (Ball) and *Scaphytopius* (*Cloanthanus*) *rubellus* (Sanders and DeLong). Lectoallotype only is designated for each of the following species: *Scaphytopius*

(*Cloanthanus*) *fuscifrons* (Van Duzee), *Scaphytopius* (*Cloanthanus*) *frontalis* (Van Duzee) and *Scaphytopius* (*Cloanthanus*) *cinereus* (Osborn and Ball). Lectotype, allotype and parallotypes are designated for each of the following species: *Platymetopius palliolatus* (Ball), *Scaphytopius* (*Tumeus*) *majestus* (Ball), *Scaphytopius* (*Cloanthanus*) *torridus* (Ball), *Scaphytopius* (*Cloanthanus*) *compactus* (Ball), *Scaphytopius* (*Cloanthanus*) *dorsalis* (Ball), *Scaphytopius* (*Cloanthanus*) *scriptus* (Ball), *Scaphytopius* (*Cloanthanus*) *nigriviridis dixianus* (Ball), *Scaphytopius* (*Cloanthanus*) *oregonensis* (Baker), *Scaphytopius* (*Cloanthanus*) *latus* (Baker), *Scaphytopius* (*Cloanthanus*) *trilineatus* (Ball) and *Scaphytopius* (*Cloanthanus*) *abbreviatus* (DeLong). Lectotype only is designated for *Scaphytopius* (*Cloanthanus*) *vercundus* (Van Duzee). Allotype and parallotypes are designated for *Scaphytopius* (*Scaphytopius*) *elegans* (Van Duzee), *Scaphytopius* (*Scaphytopius*) *catalinus* (Ball) and *Scaphytopius* (*Cloanthanus*) *loricatus* (Van Duzee). *Scaphytopius* (*Cloanthanus*) *torridus* (Ball), *Scaphytopius* (*Cloanthanus*) *cinnamomeus* (Osborn) and *Scaphytopius* (*Cloanthanus*) *dorsalis* (Ball) are considered full species rather than varieties of other species. *Scaphytopius* (*Cloanthanus*) *xanthanus* (Ball), *Scaphytopius* (*Cloanthanus*) *compactus* (Ball) and *Scaphytopius* (*Cloanthanus*) *collaris* (Sanders and DeLong) have been reduced from full species to subspecies. *Scaphytopius* (*Cloanthanus*) *nogalinus* (Ball) and *Scaphytopius* (*Cloanthanus*) *dixianus* (Ball) are considered subspecies rather than varieties.

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INTRODUCTION

THIS paper is a revision of the tribe *Scaphytopini* in America north of México and includes the following genera: *Platymetopius* Burmeister, *Japananus* Ball and *Scaphytopius* Ball. The genus *Scaphytopius* is divided into four subgenera—*Scaphytopius* Ball, *Cloanthanus* Ball, *Tumens* DeLong and *Vertanus* Hepner.

More than twenty-five thousand specimens have been examined, including types, paratypes or compared with type specimens of all but the following species: *Japananus hyalinus* (Osborn), *Scaphytopius (Cloanthanus) osborni* (Van Duzee), *Scaphytopius (Cloanthanus) magdalenensis* (Provancher), *Scaphytopius (Cloanthanus) modestus* (Stal), *Scaphytopius (Cloanthanus) analis* var. *castranis* (Ball), *Scaphytopius (Cloanthanus) rubellus* (Sanders and DeLong), *Scaphytopius (Cloanthanus) acutus* (Say) and *Scaphytopius (Cloanthanus) abbreviatus* (DeLong).

Platymetopius Burmeister was named in 1838 as a subgenus with *rostratus* (Herrich-Schaeffer) listed first and no genotype designated. *Japananus* Ball in 1931 with *hyalinus* (Osborn) as genotype and *Scaphytopius* Ball in 1931 with *elegans* (Van Duzee) as genotype. Among the subgenera of *Scaphytopius*, *Cloanthanus* Ball was named in 1931 with *angustatus* (Osborn) as genotype, *Tumens* DeLong in 1943 with *serrellus* DeLong as genotype and *Vertanus* Hepner in 1946 with *ulcus* as genotype.

In 1910, E. P. Van Duzee published a revision of the genus *Platymetopius* in America. He included twenty-eight species, subspecies and varieties found north of México.

In 1931, E. D. Ball described seven new genera—*Japananus*, *Scaphytopius*, *Deltopinus*, *Convelinus*, *Nasutoideus*, *Platymoideus* and *Cloanthanus*, in which he placed the species formerly considered in *Platymetopius*. However, my studies of the internal male genitalia showed definitely that these genera, as limited, did not satisfactorily show the proper relation of, or group the species. For example: *castranus*, placed in *Convelinus*, was more closely related to those species in *Nasutoideus*; *heldoranus*, named in *Nasutoideus*, proved more like *Platymoideus*; *dorsalis* fitted into no genus as limited. *Japananus* and *Scaphytopius* are the two genera retained of those erected by Ball in 1931, with *Cloanthanus* retained as a subgenus. *Scaphytopius (Scaphytopius)* is retained to include *elegans*, *ritanus* and *catalinus* just as Ball did, plus *huachucus*, named later

by DeLong (1944). All the other species have been placed in *Scaphytopius* (*Cloanthanus*) with the exception of *majestus*, placed in *Scaphytopius* (*Tumecus*) DeLong.

Host plants are known for a great many of the species and this information is given for each individual species in the description.

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TECHNIQUE OF STUDY

Equipment Used: Dissecting microscope, for dissection and study of specimens; art gum erasers with a hole, one-sixteenth inch in diameter and one-half inch deep; at least two dissecting needles, one with the tip bent at a one-hundred degree angle; metal loop for transferring genitalia; a casserole for heating caustic potash or soda; a small glass container for distilled water; well slide for dissection in glycerine; slides and cover slips for mounting; slide labels; specimen dissection labels; wax pencil for temporary labels on slide; small vials and corks for staining and placing unmounted genitalia on the same pin with the specimen; a bottle of diaphane for permanent slides; a silk or linen cloth for cleaning slides; tweezers for placing the coverslip on the slide; photographic equipment for making negative prints; photographic paper; eight by five inch cards; photographic mounting paper.

Dissection of Male Genitalia: The head of the insect pin is inserted into the hole in the art gum eraser so that the insect is upside down with the dorsal part of the insect against the eraser. By using a dissecting needle, the entire abdomen is separated from the rest of the insect. The abdomen is transferred to the casserole of caustic potash or soda by a moistened metal loop, where it is boiled slowly for two to ten minutes. As the solution evaporates, distilled water and caustic solution are alternately added to retain about the same amount in the casserole.

Upon removal from the caustic solution, the abdomen is rinsed in distilled water and placed in a drop of glycerine on a slide, ready for dissection. The genital capsule is removed by holding the abdomen with the bent needle in the left hand and using the other needle to pull the capsule loose at its point of attachment. The capsule is then placed so that the tip of the plates and pygofer are directed away from the dissector.

In order to see the parts more easily, the pygofer are separated from the rest of the capsule. To do this the bent needle is placed along the anterior margin where the pygofer and plate join, holding this part against the slide while the straight needle is used to tear gently the connection between the two parts. The anal tube is held by the bent needle and torn out, care being taken that the aedeagus is not pulled off with it. In many species of *Scaphytopius*, the aedeagus is more strongly attached to the base of the anal tube and pygofer lining than to the other genital parts. It has been found necessary to tear loose the inner lining of the pygofer with the aedeagus in order that the aedeagus remain with the other genital parts. This is done by holding the pygofer with the bent needle and gently tearing loose this lining, along with the connectives of the base of the aedeagus. This lining is then teased or cut away so as not to interfere with the genital parts. If possible, the other connective between the plate and pygofer is best left intact until the permanent slide is made. If no slide is desired, the opened capsule is put in a small vial with a drop of glycerine and the pin of the dissected specimen stuck through the cork so that the genitalia are on the same pin as the specimen from which it was taken.

Staining: If slides are to be made, it is best to stain the parts. For this purpose a one and one-half percent aqueous mercurochrome solution is used. The genitalia are rinsed in distilled water to remove the glycerine and put in a small jug containing the stain. The jug is then put on the same pin as the dissected specimen as described above, so there will be no danger of confusion where several genitalia are being stained at the same time. The genitalia are left in the stain from one to twenty-four hours, depending on the darkness of the specimen and intensity of stain desired.

Temporary Slides: Whenever possible, permanent slides should be made, but in some cases it is necessary to make temporary slides so that the genitalia may be placed on the same pin as the dissected insect after the genitalia have been studied or photographed.

In this case the genitalia are rinsed in water to remove all surplus stain and then mounted in glycerine. In most cases negative prints are made of the parts and the prints studied. The cover slip should not be left on the slide any longer than necessary, as this tends to flatten the parts.

Permanent Slides: The genitalia are rinsed in distilled water to remove surplus stain and then placed in a drop of glycerine on a slide (a well slide is best) and any surplus tissue is removed and the plates are separated so that the aedeagus may be seen between them. The genitalia are then put in clean water so that the glycerine is completely removed. A slide and cover slip are then cleaned so that no dirt or lint is present, especially if prints are to be made. A silk or linen cloth is best for this purpose.

The genital parts are then placed in 95% alcohol for thirty seconds to one minute for dehydration. If left longer than this, the paraphyses, especially if coiled, tend to break near the base when the cover slip is put on, and the genitalia are flattened. A drop of diaphane is placed in the middle of the slide and the genital parts put in it with the metal loop. The dissecting needles are then used to separate the pygofer from the rest of the capsule and the parts are arranged as desired. The cover slip is then placed slowly on the diaphane so that no bubbles will be formed. This is best done with tweezers, one side of the cover slip being placed on the slide and the other side slowly lowered until the cover slip touches the diaphane. The cover slip is pressed down slowly and evenly until the parts are flattened. Not over forty-five seconds should be allowed from the time the diaphane is put on the slide until the cover slip is placed in position. The slide should remain in a horizontal position for several days—until the diaphane has completely dried.

The slide is numbered and the insect given a corresponding number. If the last ventral segment of the female is mounted, the same procedure is used and mounted on the same slide with a male of the same species.

Photographing and Studying Genitalia: In studying the male genitalia, negative prints are made and studied. This consists of directing a strong light through the slide, an objective and an ocular, onto sensitive paper, using a magnification of ninety times for the male genitalia and sixty times for the last ventral segment of the female. The prints, four by five inches for the males, half this size for the females, are then mounted, by using photographic mounting

paper, on five by eight inch cards. These cards are given the same number as the slide and filed for study. In determining variation in a species, or differences in the genitalia of different species, these cards are of inestimable value. Any additional information regarding a specimen or species is written on the back side of the card. When specimens are determined, the species name is written on each card.

Prints similar to those used for study were made for this publication, but a dark amber filter was used to allow for a longer exposure, resulting in a clearer image.

CHARACTERS USED IN CLASSIFICATION

The characters used most in separating species were differences in the male genitalia—the paraphyses, aedeagus, and to a lesser degree, the valve, plates and pygofer.

External structural features used were the length and shape of crown; length of pronotum at middle and behind eye in relation to width; length and shape of clypeus, shape of face in lateral view and arrangement of veins in forewing. The variation in color and color pattern was helpful, if accompanied by some structural difference.

TERMINOLOGY

The terminology used by P. W. Oman (1936) was followed in this paper. The *crown* is that part often termed "vertex" and is the dorsal part of the head between the eyes; the *median suture* is the line down the center of the crown, terminating anteriorly in the "*wedge*." By *length of crown* is meant the length on median line and *width between eyes* is the shortest width between the eyes. *Width of pronotum* refers to the distance from one lateral margin to the other; *length behind eyes* refers to the distance from the most posterior portion of the eye to the margin of the pronotum directly posterior to it. The *clypeus* is that part sometimes termed the "frons," length refers to the greatest length and *width at ocelli* refers to the shortest distance between the margins of the clypeus at ocelli. The "*sharks-mouth*" is the inverted V-shaped marking found near the base of clypeus in almost all species of *Scaphytopius*. The *clypellus* is the sclerite extending from the apex of clypeus to the external mouthparts. *Lorae* are the small, circular sclerites on each side of clypellus. The *genae* refers to all the rest of the face. The *forewing* refers to the outer wing, often called the tegmina. The *brachial cell* is that cell in the corium bordering the claval vein.

In regard to the genitalia, Mr. R. E. Snodgrass was consulted as to the names of the various parts. The copulatory organ is termed *aedeagus*; processes of the aedeagus, the genital paraphyses; the parameres, the *styles*; the ventral plate of the male, the *valve*; the ventral apical processes, the *plates*; and the apical dorsal processes, the *pygofers*.

SYNOPSIS OF TRIBE SCAPHYTOPINI

Crown relatively flat with anterior margin distinct; pronotum convex anteriorly and concave posteriorly; forewing with distinct appendix and either one or two cross-veins; clypeus broadest along posterior margin, sinuate or straight at antennae; clypellus usually broadest near apex; genae expanded and extending behind eyes, visible from above; ocelli on margin of crown, near eyes.

KEY TO GENERA OF TRIBE SCAPHYTOPINI

1. Crown with shortest width between eyes greater than length at middle; lateral margin of genae with small concavity beneath eye. *Platymetopius* Burmeister, page 420
Crown as long as or longer at middle than shortest width between eyes. 2
2. (1) Only one cross-vein in costal cell; claval veins united at middle,
Japananus Ball, page 423
More than one cross-vein in costal cell or claval veins not united at middle,
Scaphytopius Ball, page 426

SYNOPSIS OF GENUS PLATYMETOPIUS BURMEISTER

Jassus subgenus *Platymetopius* Burmeister, Genera insectorum iconibus illustravit et descripsit. 1: pl. 14, subgenus 4, 1838.

The original reference to the genus *Platymetopius* is as follows:

"Subgenus 4, *Platymetopius*

"37. *J. rostratus* Herr. Schaeff. Fn 122. 2.

"38. *J. vittatus* Fabr. Germ. C. undata Pz. Fn. Germ. C. flammigera de Vill. Ent. (tab. rostra fig. 4 caput cum pronoto et scutello, fig. 5 caput infra.)

Spec. complures, huic subgeneri adscriptae, in Mus. Germari Halae asservantur, quarum nomina haec:

J. impluviatus Germ., e Pennsylvania

J. meta Germ., e Pennsylvania

J. costalis Germ., Brasilia."

The generic name attained nomenclatorial status in the above indicated publication by virtue of the inclusion of the previously described species. The first designation of a type species appears to have been by Van Duzee (Ent. Soc. Amer. Ann. 3: 214, 1910), who designated *Jassus rostratus* Herrich-Schaffer, 1834, as type.

Additional data relative to American species are as follows: Crown much wider than length at middle, anterior margin rounded

to a bluntly pointed apex; pronotum almost parallel margined on median half; forewing with numerous veins to costa; clypeus almost as broad between ocelli as median length and over three times as wide at base as at apex, sinuate at antennal sockets; clypellus more than one-third as long as clypeus, only slightly broadest at apex and barely reaching genae; lateral margin with small concavity beneath eye; relatively deep pit from antennal socket to ventral margin of eye; face convex in lateral view.

KEY TO SPECIES OF PLATYMETOPIUS BURMEISTER

1. Forewing fulvous to brown with milky spots.....1. *vitellinus* (Fitch), page 421
- Forewing green with thin brown area along mesal margin...2. *palliolatus* (Ball), page 422

1. *Platymetopius vitellinus* (Fitch)

Acocephalus vitellinus, Fitch, Asa, Catalogue with references and descriptions of the insects collected and arranged for the State Cabinet on Natural History—Ann. Report State Cabinet Nat. Hist. of N. Y., IV: p. 57, 1851.

Resembling *palliolatus* but with shorter, yellow crown and brownish forewings. Length: female 6 mm., male 5 mm.

Color: Crown and face ivory to yellow and without darker markings. Pronotum brown, yellowish along anterior margin, indications of three pale vittae, one on median line and another on each side. Scutellum about same color as crown, with a large orange to brown spot near each basal corner. Forewing pale hyaline amber with darker clouded areas in clavus and an irregular, oblique, clouded vitta from apex of clavus to costal margin; veins light.

Structural Characteristics: Crown about half as long at middle as width between eyes, only slightly longer at middle than next eyes; shallow transverse furrow near rounded anterior margin. Pronotum almost twice length of crown, slightly more than twice as wide as length at middle. Clypeus only slightly longer than width at ocelli, distinctly sinuate at antennae. Clypellus relatively broad and only slightly enlarged near apex. Lateral margins of genae concave near eye, convex on apical two-thirds. Face in lateral view distinctly convex, except for slight arcuate concavity joining antennal sockets. Forewing with four or five recurved veins to costa.

Genitalia: Valve triangular, about one and one-half times as wide as length at middle, posterior margin slightly convex on each side of a rounded apex. Aedeagus in ventral view broadest at base, narrowest on apical third; two pairs of lateral processes, one pair from near base extending beyond apex of shaft, and another pair at apex about two-fifths length of shaft. Styles less than one and

one-half times as long as basal width, apical half slender and almost parallel margined. Pygofer roughly triangular, with hook somewhat falcate and sharply pointed.

Last ventral segment of female about twice as wide as length at middle, lateral margins convex, posterior margin with a large, rounded lobe on each side of a small median lobe which may or may not be notched at middle.

Types: Holotype ♂, No. 762, allotype ♀, No. 763, in the New York State Museum, Albany, N. Y.

Material Examined: (British Columbia) Hope, Merritt, Vernon. (Manitoba) Russell, Birch River, Keld, Mafeking, Hartney. (Ontario) Toronto. (Montana) Missoula, Bozeman. (Utah) Barclay. (Colorado) Pagosa Springs, North Peak, Dutch Gap, Ft. Collins. (North Dakota) Tarkio, Hamar. (Minnesota) Two Harbors. (Wisconsin) Rib Mt. State Park. (Michigan) Cheboygan Co., Douglas Lake, Clare Co. (New Hampshire) Bretton Woods, Center Harbor, Notchland. (Tennessee) Clarksville.

Host Plants: Ball (1932) writes "The writer has reported this species as curling and reddening the leaves of roses. Later at Woods Hole it was found curling and coloring the leaves of blackberry and dewberry." Lowry (1933) gives grasses, sedges and shrubs in collection data regarding this species.

Comparative Notes: This species has a wide range but shows little variation except that the specimens from Tennessee were slightly larger.

2. *Platymetopius palliolatus* (Ball)

Eutettix palliolatus, Ball, E. D., Can. Ent., XXXIV: p. 13, 1902.

Resembling *vitellinus* but green with brown pronotum, scutellum and area along clavus. Length: female 5.5 mm., male 5 mm.

Color: Crown green and without markings. Pronotum dark reddish-brown, a pair of irregular broad orange vittae on disc and extreme lateral margin white. Scutellum about same color as pronotum, indication of two oblique light vittae near disc. Face greenish-yellow without definite markings. Forewing hyaline green except for white-margined, narrow brown area from near base of wing, along scutellar and sutural margin to apex of wing; two or three white aeroles in clavus and a like number in apical cells.

Structural Characteristics: Crown about two-thirds as long as width between eyes, slightly more pointed than in *vitellinus*, with

transverse furrow indistinct or absent. Pronotum slightly longer than crown, about twice as wide as length at middle. Clypeus only slightly longer than width at ocelli, sinuate at antennae. Clypellus relatively stout and somewhat enlarged near apex. Face distinctly convex in lateral view. Forewing with three or four recurved veins to costa, especially near apex.

Genitalia: Valve almost twice as wide as length at middle, posterior margin almost straight on each side of a bluntly pointed apex. Plates long and slender. Aedeagus in lateral view short, broadest at base, almost parallel-margined on apical two-thirds with a pair of short, slender apical processes. Styles short, less than twice as long as basal width, slightly sinuate on basal third, with short, rounded apical process.

Last ventral segment of female somewhat converging on lateral margins; posterior margin almost straight except for median lobe notched at middle.

Types: Lectotype ♀, "Tex. Collection C. V. Riley" collected by Belfrage, in the National Museum, Washington, D. C., allotype ♂ and 45 ♂ paratypes, Seymore, Texas, June 30, 1936, R. H. Beamer, in the Snow Entomological Collections, here designated. Additional ♂ paratypes from Texas as follows: 1, Palo Pinto Co., July 14, 1928, R. H. Beamer; 1, San Saba Camp, July 1, 1936, R. H. Beamer; 1, Loyal Valley, July 2, 1936, R. H. Beamer; 2, Castroville, July 5, 1936, R. H. Beamer; 1, San Antonio, July 4, 1936, R. H. Beamer; 1, Seguin, June 26, 1938, R. H. Beamer; 3, Concan, July 6, 1936, R. H. Beamer.

Host Plants: Fletcher (1930) writes regarding this species, "on wild sunflower at Dallas."

Comparative Notes: This species is easily recognized by its distinctive color markings and is evidently restricted to Texas.

SYNOPSIS OF GENUS *JAPANANUS* BALL

Japananus, Ball, E. D., Can. Ent., LXIII: p. 218, 1931.

The original description of *Japananus* is as follows:

"Resembling *Platymetopius* (sens. strict.) in the narrow head the single cross nervure and the lack of vermiculations but also lacking the supernumerary costal veinlets of that genus.

"A narrow headed form with a long acute vertex in the female, a short and but slightly acute one in the male, a broad pronotum strongly constricted and advanced between the eyes, a large scutellum, broad elytra with simple venation and no reticulations,

a single cross nervure between the sectors. Three large cells occupy the apical portion of the elytra, the first apical forming a long narrow cell against the costa bounded by two short veinlets at right angles to costa. The posterior veinlet is in line with the apex of the outer anteapical, the second apical therefore triangular as in the fifth. Face in profile acutely angled with vertex, front narrow, in the female, produced in a triangle with the vertex. A hairlike dark line just beneath the margin.

"Type of the genus, *Platymetopius hyalinus* Osb.

"This introduced species has no close relationships with any other North American form and while lacking the second sector it does not belong in *Platymetopius* proper nor even close to that group as indicated by the widely different head characters and genital patterns.

"The remainder of the American groups agree in possessing the narrow head with the pronotum narrowed between the eyes, the second cross nervure, a large number of reflexed veinlets to costa, the white triangle or "Sharksmouth" marking on the front and more or less of reticulations and vermiculations. None of these groups are represented in the European fauna as far as known."

Additional data regarding *Japananus* is as follows: Crown flat, sharply pointed, longer than shortest width between eyes, median suture and wedge distinct; pronotum very convex on anterior margin, much wider at middle than behind eyes; forewing with claval veins joined near middle, only two veins to costa and one cross-vein in discal cell; clypeus long and slender, lateral margins hardly sinuate at antennae; clypellus over one-third length of clypeus, enlarged near apex, reaching slightly beyond genae. Shallow concavity on genae from antennae to ventral part of eye.

3. *Japananus hyalinus* (Osborn)

Platymetopius hyalinus, Osborn, Ent. News, XI, p. 501, 1900.

Platymetopius cinctus, Matsumura, Jour. Tohoku Imperial Univ. College of Agri., V: p. 215, 1914.

Yellow to greenish, sharply pointed crown, resembling no other species in the group. Length: female 5.5 mm., male 4.5 mm.

Color: Crown pale green to greenish-brown along margin, becoming darker on disc; apical wedge light. Pronotum mottled dark gray in male, dark green in female, darkest on disc. Scutellum slightly lighter than pronotum with dark markings, if present, irregular in shape. Face pale fulvous fading to gray on lateral margin of genae in male, greenish-yellow in female; irregular dark line just

below base, connecting ocelli. Forewings pale greenish hyaline (almost colorless in male), with following dark markings: four or five lines or dots near middle and a mark in apex of clavus; cross vein on anterior margin of discal cell; area where apical and ante-apical cells join; and a dot on costa opposite apex of clavus.

Structural Characteristics: Crown about one and one-third times as long as width between eyes in male, twice as long as width between eyes in female, almost straight on each side of a sharply pointed apex; concavity on disc; distinct wedge. Pronotum about as long as crown in male; two-thirds length of crown in female, two and one-third times as wide as length at middle and five times length behind eyes, extending beyond eye on each side, posterior margin with shallow notch at middle. Clypeus about twice as long as width at ocelli, not sinuate at antennae. Clypellus large, enlarged near apex. Face in lateral view slightly convex in male, concave between anterior margin of eyes in female. Forewing with the two claval veins united except at ends and only one cross vein to costa.

Genitalia: Genital parts long and slender. Valve triangular, about twice as wide as length at middle. Shaft of aedeagus short, base long and with a pair of slender processes, each bifid on outer fifth, one part straight the other acutely recurved at base and recurved again on apical two-thirds. Plates with a parallel-margined apical process longer than remainder of plate. Styles long, broadest near basal third, slightly lobed on outer margin before blunt outward-projecting apical process.

Last ventral segment of female slightly longer than greatest width, latero-posterior margin convex on basal third, broadly concave on each side of a long median lobe on apical two-thirds.

Types: Lectotype ♂, lectoallotype ♀, Washington, D. C., 1897, J. S. Hine, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio.

Material Studied: (Connecticut) New Haven. (New Jersey) South Orange, Springfield. (D. C.) Washington. (Virginia) Falls Church, Dismal Swamp, Arlington. (Tennessee) Clarksville. (Ohio) Barberton. (Oregon) Portland.

Host Plants: Ball (1932) writes "—feeds both as nymphs and adults, on the Japanese maple." DeLong (1923) writes "apparently an imported species occurring on Japanese and sugar maples, and perhaps other species of the same group."

Comparative Notes: Evidently this easily recognized, introduced species is fairly well distributed in many parts of the United States.

SYNOPSIS OF GENUS SCAPHYTOPIUS BALL

Scaphytopius, Ball, E. D., Can. Ent., LXIII: p. 218, 1931.

The original description of *Scaphytopius* is as follows:

"Resembling *Platymetopius* as formerly recognized but lacking most of the vermiculations. Allied to *Scaphoideus* Van Duzee, relatively short and stout species with two cross nervures, numerous oblique veinlets to costa and about three or four lines on face paralleling the vertex margins.

"Vertex rather broad and flat, slightly acutely angled and nearly the same length in both sexes—eyes large oblique and enclosing one-half of the pronotum. Face convex, the profile straight and acutely angled with vertex. Front narrow and almost parallel margined below antennae. The 'shark's mouth' markings and the vertex margin both narrowly edged with black, often a line between these. Pronotum much broader than head, the anterior half constricted by the oblique eyes. Elytra as in *Scaphoideus* except for two cross nervures, the venation regular and strongly emphasized on posterior half.

"Type of the genus, *Platymetopius elegans* Van Duzee."

Additional characteristics of the genus are as follows: Crown pointed, longer at middle than shortest width between eyes; pronotum much longer at middle than behind eyes, shortest on lateral margins; forewing with several veins to costa and either one or two veins in discal cell; clypeus narrow, usually slightly sinuate at antennae, broadest at ocelli; clypellus broadest near apex, extending to or beyond margin of genae.

KEY TO SUBGENERA OF SCAPHYTOPIUS BALL

1. Broad, irregular, whitish, sunken band near apex of crown; sharp carina on basal half of clypeus.....*Vertanus* Hepner, page 427
No band nor carina as described above..... 2
2. (1) Crown fulvous without distinct dark markings, with light markings on disc consisting of a long light vitta on each side of median suture posterior to light wedge; distinctly convex on each side of an acutely angled apex. Clypeus uniform brown to black with distinct white line along posterior margin between ocelli and thin sharkmouth reaching to or almost to margin of clypeus,
Tumeus DeLong, page 428
Crown and clypeus not as above..... 3
3. (2) Clypellus with apical fourth reaching beyond normal curve of genae,
Scaphytopius Ball, page 432
Clypellus with less than apical fourth reaching beyond normal curve of genae,
Cloanthanus Ball, page 439

SYNOPSIS OF SUBGENUS VERTANUS HEPNER

Vertanus, Hepner, L. W., J. Kans. Ent. Soc., p. 87, 1946.

Crown broadly convex on each side of a sharp apex, irregular, sunken, unmarked band before eyes; forewings broad with wide costal cell and several strongly recurved veins to costa; clypeus long, much wider on basal third with a thin median carina on basal half, strongly sinuate at antennae; clypellus slender, slightly enlarged near apex and extending beyond normal curve of genae; lorae oval; lateral margins of genae convex, small pit at base of antennae.

Type of subgenus—*Scaphytopius* (*Vertanus*) *ulcus* Hepner.

4. *Scaphytopius* (*Vertanus*) *ulcus* Hepner

Scaphytopius (*Vertanus*) *ulcus*, Hepner, Jour. Kans. Ent. Soc., XIX, p. 87, 1946.

A striking species unlike any other north of México, with broad colorless band on crown and sharply carinate clypeus. Length: female 5.2 mm., male 5 mm.

Color: Crown with apical fifth mottled brown to fuscous, excepting wedge; broad irregular, colorless band across crown on apical third, remainder with vittae as follows: ivory along outer margin, broad brown, fuscous-margined vitta just inside this, with narrow ivory, fuscous and white lines in that order before thin fuscous line on each side of median suture; slightly lighter in female. Pronotum with broad light and dark alternating vittae, the light ones lined with fuscous. Scutellum about same color as pronotum. Clypeus mottled brown and yellow on apical half, basal half brown on lateral margins, remainder black except white sharksmouth and irregular oblique broad white vittae from near sharksmouth to basal margin. Remainder of face mottled brown and yellow except for white vitta behind eye and dot near ocellus and antenna. Forewing semihyaline yellow, at least on disc of clavus, in apical cells, and along some of veins; remainder semihyaline white or colorless, excepting black clouded areas in clavus and especially in discal and anteapical cells, one conspicuous mark through outer anteapical to costal margin; distinct hyaline spot in posterior end on middle and outer anteapicals.

Structural Characteristics: Crown slightly over twice as long as width between eyes, anterior margin strongly convex on each side of a sharply pointed apex; concave on disc. Pronotum slightly over half as long as crown, two and one-fourth times as wide as length at middle, and three and one-half times length behind eyes, broadly

concave on posterior margin. Clypeus about two and one-fourth times as long as width at antennae, sharp median carina on apical half and rather strong concavity on each side, lateral margins sinuate at antennae. Clypellus relatively stout, enlarged at apex. Face in lateral view strongly concave. Forewing with several vein-like marks in brachial cell, sometimes extra veins on clavus and six or seven strongly reflexed veins to costa.

Genitalia: Valve triangular, about two-thirds as long as greatest width, posterior margin slightly concave on each side of a sharply pointed apex. Aedeagus large, basal portion roughly cone shaped with a large "U"-shaped apical portion about as long as base but about twice as wide. Plates short and truncate. Styles projecting mesally, about twice as long as basal width, large lobe on outer margin just before short, blunt, outward-projecting apical process.

Last ventral segment of female convex and converging on lateral margins; posterior margin with a distinct, blunt lobe on each side of a small median notch.

Types: Holotype ♂, allotype ♀ and 2 pairs of paratypes, Hidalgo, Texas, Dec. 28, 1945, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: 5 ♀ ♀, 2 ♂ ♂, Brownsville, Texas, June 29, 1938, 1 pair, July 3, 1938, R. H. Beamer; 1 ♀, Brownsville, Texas, May 25, 1939, D. J. and J. N. Knull; 1 pair, Progresso, Texas, July 1, 1938, R. H. Beamer; 1 ♂, Taxco, Mexico, Aug. 22, 1936, W. E. Stone; 1 ♂, Mexico, April 10, 1939.

Host Plants: The specimen labelled "Mexico" was collected from cantaloupe.

Comparative Notes: The white band on crown and carina on clypeus easily separates this species from any other. There is evidently much variation in the length of the crown as one of the specimens from Mexico had a longer crown and the other a shorter one than the type, but the internal genitalia proved to be the same.

SYNOPSIS OF SUBGENUS TUMEUS DELONG

Tumeus, DeLong, D. M., Bull. Brook. Ent. Soc., p. 168, 1943.

The original description of the subgenus is as follows:

"Related to *Cloanthanus* but with a flat, more broadened and bluntly angled vertex with the sides convexly rounded to form a narrow, rounded tip. The face is broader than in *Cloanthanus*, but the angled line just beneath the apex of vertex resembles the markings of that genus. The venation is similar in type to *Cloanthanus*, the

coastal veinlets are of the same type and the first anteapical cell is usually decidedly shorter than the second anteapical cell. Genotype *Tumeus serrellus* n. sp."

Additional characteristics regarding the subgenus are as follows: Crown broad, anterior margin convex on each side of a sharply pointed apex, markings consisting of a light vitta on each side of median suture from base to wedge; light vitta on pronotum very faint or absent; forewings relatively long and slender, outer anteapical short, central anteapical narrowed near apex; clypeus dark, without dots, a light line along basal margin joining ocelli and a long slender sharksmouth; slightly sinuate at antennae; clypellus slightly enlarged near apex, barely reaching to normal curve of genae.

KEY TO SPECIES OF SCAPHYTOPIUS (TUMEUS) DeLONG

1. Frons mostly black: California.....5. *majestus* (Ball), page 429
- Frons brown: Texas.....6. *tezanus* DeLong, page 431

5. *Scaphytopius* (*Tumeus*) *majestus* (Ball)

Platymetopius majestus, Ball, E. D., Ent. News, XX: p. 164, 1909.

Resembling *Scaphytopius elegans* somewhat but without the broad dorsal yellow stripe, with crown much broader and with anterior margin distinctly convex on each side of pointed apex. Length: female 5 mm., male 4.5 mm.

Color: Crown yellow and orange with a broad, light vitta on each side of median suture on basal four-fifths, light wedge on apical fifth. Pronotum usually darker than crown, lightest along anterior margin. Scutellum about same color as crown. Clypeus with narrow light band along base between eyes and a long, light sharksmouth; remainder dark chocolate brown, except for lighter brown area between sharksmouth and basal margin. Genae lighter than clypeus. Clypellus and lorae either color of clypeus or genae, or varying between the two colors; light vitta behind eye and dots before eye usually present. Forewing semihyaline brown to fuscous, lightest on clavus and costa, darkest on outer anteapical cell and apex of corium and clavus.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin definitely and broadly convex on each side of a pointed apex. Pronotum half as long as crown in female, proportionately longer in male, about two and one-half times as wide as length at middle and three and one-half times length behind eye; posterior margin convex behind outer margin of eye, concave

at middle with a small median notch. Clypeus about twice as long as width at ocelli, lateral margin sinuate at antennae. Clypellus much larger near apex. Face in lateral view definitely concave. Forewing with six or seven recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin rounded, anterior margin with relatively long lobe on median two-fifths. Single paraphysis, "hinged" on basal third, bifid on outer third, each branch of which is bifid, with the outer branch longer than the inner. Aedeagus very short and broad, resembling a ring. Styles slightly more than twice as long as basal width, slightly sinuate near middle, small lobe on outer margin before curved, outward-projecting apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin straight near base, convergant on apical three-fifths; posterior margin straight except for median lobe with a notch at middle.

Types: Holotype ♂, Pasadena, California, June 17, 1908, in the National Museum, Washington, D. C. Allotype ♀ and 7 ♀ paratypes, Miramar, Calif., July 28, 1938, R. H. Beamer, in the Snow Entomological Collections. Additional ♀ paratypes from California as follows: 6, Irvine Park, Aug. 4, 1939, R. H. Beamer; 1, Boulevard, July 26, 1938, R. H. Beamer; 1, San Antonio Canyon, Aug. 4, 1938, R. H. Beamer; 1, San Antonio Canyon, Aug. 4, 1938, R. I. Sailer; 2, Mt. Tamalpais, Aug. 15, 1938, R. H. Beamer; 5, La Jolla, July 13, 1941, R. H. Beamer; 1, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 3, Mint Canyon, July 6, 1933, R. H. Beamer; 2, San Diego, Aug. 7, 1935, 1, Dec. 24, 1941, R. H. Beamer; 1, Nipomo, July 24, 1935, R. H. Beamer.

Host Plants: Ball (1932) writes "—taken in June by the writer on a tall *Rhus* growing in isolated clumps at Pasadena." Specimens collected on *Photinia arbutifolia* at Mt. Tamalpais, California, and on *Rhus integrifolia* at Miramar, California, were examined.

Comparative Notes: This dark, slender species can hardly be confused with any other species in California, and the male genitalia is distinctly different from any other, with the single, twice bifid paraphysis.

Scaphytopius (Tumeus) texanus DeLong

Tumeus texanus, DeLong, D. M., Bull. Brook. Ent. Soc., XXXVIII: p. 170, 1943.

Resembles *majestus* somewhat, but with shorter crown and light brown dorsum. Length: female 5 mm., male 4.5 mm.

Color: Crown pale greenish-fulvous, thin dark line along anterior margin, pale vitta on each side of median suture on basal three-fourths, median vitta on apical fourth; pale areas bordered by dark. Pronotum darker than crown, lightest on anterior and lateral margins, usually some vermiculations on disc; vittae sometimes evident on lateral margins. Scutellum about same color as crown, light in each basal corner and an irregular, slightly oblique line from lateral margin to anterior margin, usually fuscous lined. Face chocolate brown excepting light markings as follows: thin line along anterior margin, long sharksmouth, three or four pairs of short, oblique lines on disc of clypeus, line behind eye and a dot before eye. Forewing semihyaline greenish-fulvous, large milky aeroles in clavus, anteapical and apical cells, most cells in corium, except middle apical cell, with large hyaline area, dark vermiculations throughout; veins light except on apex and costal margin.

Structural Characteristics: Crown one and two-thirds times as long as width between eyes in male, slightly longer in female, anterior margin slightly convex on each side of bluntly pointed apex in male, more strongly convex in female. Pronotum about three-fifths length of crown in male, relatively shorter in female, two and one-half times as wide as length at middle and four times length behind eyes, posterior margin only slightly concave. Clypeus about twice as long as width at ocelli, lateral margins constricted at antennae, shallow concavity along sharksmouth. Clypellus stout and enlarged near apex. Face in lateral view concave between anterior margin of eyes, especially in female. Forewing with numerous vein-like marks in brachial cell and about seven recurved veins to costa.

Genitalia: Valve about four-fifths as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin with short, broad median lobe. Plates short but sharply pointed. Paraphysis single, bulblike at base with a slender hairlike apical part. Aedeagus attached to base of paraphysis; shaft in lateral view, straight, narrowing to apex with a pair of short, slender apical processes. Styles slightly more than twice as long as basal width, outer margin with pointed lobe before long, slender, curved process on apical half.

Last ventral segment of female almost twice as wide as length at middle, lateral margins straight, posterior margin convergent to a median lobe with a small notch at middle.

Types: Holotype ♂, allotype ♀, Brownsville, Texas, May 8, 1935, J. N. Knull, in the DeLong Collection, Ohio State University, Columbus, Ohio.

Material Studied: (Texas) Concan, Progresso, Brownsville.

Host Plants: The host plant is not known.

Comparative Notes: This species is easily recognized in southern Texas by the clouded dark face and distinctive crown.

SYNOPSIS OF SUBGENUS SCAPHYTOPIUS BALL

Scaphytopius, Ball, E. D., Can. Ent., LXIII: p. 218, 1931.

For original description of subgenus, see description of genus *Scaphytopius*.

Additional characteristics of the subgenus are as follows: Crown straight to slightly convex on each side of apex, markings light, but sometimes lined with dark; pronotum with vittae absent or indistinct on disc; forewing with several recurved veins to costa; clypeus sinuate at antennae, light sharksmouth near posterior margin between eyes typically present; clypellus relatively long with apical fourth extending beyond normal curve of genae; loral margins oval; genae with shallow pits for antennae.

KEY TO SPECIES OF SCAPHYTOPIUS (SCAPHYTOPIUS) BALL

1. Color hyaline brown except for wide yellowish area covering crown, middle half of pronotum, all of scutellum and mesal margin of clavus,
 7. *elegans* (Van Duzee), page 432
- Markings different than above 2
2. (1) Face unicolor; last ventral segment of female not split on posterior margin; male paraphysis roughly "T"-shaped.....8. *ritanus* Ball, page 434
- Frons usually darker than rest of face; last ventral segment of female split on posterior margin; male paraphysis not "T"-shaped..... 3
3. (2) Paraphysis of male and last ventral segment of female split to near base,
 9. *catalinus* (Ball), page 436
- Paraphysis of male and last ventral segment of female split only partly to base,
 10. *huachucus* (DeLong), page 437

7. *Scaphytopius* (*Scaphytopius*) *elegans* (Van Duzee)

Platymetopius elegans, Van Duzee, E. P., Ent. Amer., VI: p. 94, 1890.

Scaphytopius floridanus, Ball, E. D., Can. Ent., LXIII: p. 220, 1931.

Scaphytopius elegans var. *glennanus*, Ball, E. D., Can. Ent., LXIII: p. 220, 1931.

Scaphytopius floridanus var. *roseus*, Ball, E. D., Can. Ent., LXIII: p. 221, 1931.

Resembling *ritanus* but more slender, with longer crown, and forewings unclouded on corium except for apical cells. Length: female 5 mm., male 4.7 mm.

Color: Crown white to yellow with brown markings as follows: broad "Y"-shaped mark before each eye and a thin line on each side of median suture on apical two thirds. Pronotum yellow on disc, brown on each side, excepting one or two light vittae near lateral margin. Scutellum yellow. Face yellow, excepting fuscous-bordered broad sharksmouth, a line along basal margin between ocelli, and in darkly marked specimens a vitta behind eye and shorter one near ocellus. Forewing hyaline except for opaque yellow area in clavus and smaller, lighter area in apical cells; veins concolorous in clavus, dark brown to fuscous in corium.

Structural Characteristics: Crown one and one-half times as long as width between eyes in male, slightly longer in female, anterior margin straight to slightly convex on each side of a sharp apex; wedge about two-fifths length of crown. Pronotum almost as long as crown, slightly more than twice as wide as length at middle, and four times length behind eye; posterior margin slightly concave. Clypeus slightly more than twice as long as width at ocelli, somewhat sinuate at antennae. Clypellus long and slender and about one and one-half times as wide near apex as narrowest point. Face in lateral view straight to slightly concave between anterior margin of eyes. Forewing with about eight recurved veins to costa and claval veins sometimes joined near middle.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin bell-shaped, anterior margin with broad, short median lobe. Paraphysis "T"-shaped, broadest near base, apical, laterally-projecting processes sharp at apex, and with tiny teeth along the edges. Aedeagus small, about as wide as greatest width, notched at middle of flattened apical margin. Plates short and bluntly pointed. Styles about three times as long as basal width, sinuate on basal third, large lobe on outer margin on median third and bluntly pointed process on apical third.

Last ventral segment of female about twice as wide as length at middle, lateral margins straight and converging, posterior margin slightly convex.

Types: Holotype ♀, "California, Coquillett," in the Iowa State College collection, Ames, Iowa. Allotype ♂ and one parallotype ♂, Idyllwild, California, Aug. 3, 1935, R. H. Beamer, here designated, in Snow Entomological Collections. Additional ♂ parallotypes from California as follows: 1, San Margareta, Aug. 6, 1912, E. D. Ball; 1, Dulzura, Aug. 9, 1935, R. H. Beamer; 1, Lompoc, Aug.

7, 1938, R. I. Sailer; 2, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 1, Campo, Aug. 10, 1935, R. H. Beamer; 1, Pine Valley, July 27, 1938, R. H. Beamer; 11, La Jolla, July 13, 1941, R. H. Beamer; 2, Escondido, July 15, 1941, R. H. Beamer.

Additional Material Studied: (Arizona) Arivaca, Oak Creek Canyon, Chiricahua Mts., Yarnell, Jerome and Ruby. (Utah) Pintura and Zion National Park. (New Mexico) Silver City. (Texas) Sutton Co. (Florida) Sanford, La Belle, Old Town, Ocala and Yankeetown.

In addition to the types listed above, the following paratypes were on hand for study: 1 ♀ *floridanus*, Sanford, Florida, July 22, 1926, E. D. Ball, and a pair of *glennanus*, Yarnell Hts., Aug. 20, 1929, and Oct. 8, 1929, E. D. Ball.

Host Plants: Ball (1932) writes "*Scaphytopius elegans* Van Duzee is a Pacific coast form which the writer has found feeding exclusively on the live oaks of that region. Var. *glennanus* Ball was found by the writer throughout southern Arizona feeding, both nymphs and adults, on the different live oaks, especially *Q. turbinella* and *oblongifolia*."

"*S. floridanus* Ball with its var. *roseus* Ball are strictly confined to the under side of the live oak (*Q. virginiana*) in the Florida region. The margins of the leaves are revolute and furnish a fine hiding place for the young nymphs."

Comparative Notes: *S. elegans* was named from California, darker specimens from Arizona were named the variety *glennanus* and lighter specimens from Florida named *floridanus*. There are intermediate forms both in color and distribution, specimens having been studied from New Mexico, Texas and Mexico. Specimens collected in Florida in the winter are often as dark as the typical California specimens. The variety *roseus* is a reddish form, evidently specimens in which the yellow color is replaced by red, a rather common occurrence in other species of the group.

The broad, yellow vitta on dorsum readily separates this species from any other in the genus.

8. *Scaphytopius (Scaphytopius) ritanus* Ball

Scaphytopius ritanus, Ball, E. D., Can. Ent., LXIII: p. 221, 1931.

Resembling *elegans* but broader, with shorter crown, and with more clouded area on corium. Length: female 5 mm., male 5 mm.

Color: Crown yellow to orange, a thin, wavy brown line along

anterior margin; wedge, long vitta on each side of median suture and small irregular area inside each eye, lighter. Pronotum about same color as crown, often gray on disc and broad, irregular vitta formed by absence of pigment. Scutellum about same color as crown, usually somewhat darker just inside each basal angle. Clypeus reddish-fulvous, thin black line along base between ocelli; sharksmouth and three or four pairs of short, oblique lines beneath, light. Remainder of face about same color as clypeus, sometimes darkest on lateral margins, white spot near each ocellus and antenna and sometimes vitta behind eye. Forewing hyaline to semi-hyaline brown, light band before apex of clavus extending across anterior ends of anteapical cells to costa and another light band just before apex. These light bands may be white or devoid of color. Veins light brown anteriorly, becoming dark on costa and at apex.

Structural Characteristics: Crown one and one-third times as long as width between eyes, straight on each side of a pointed apex; wedge about one-third length of crown. Pronotum about as long as crown, two and one-fourth times as wide as length at middle and about four and one-half times length behind eyes, posterior margin almost straight. Clypeus about twice as long as width at ocelli, lateral margins slightly sinuate at antennae. Clypellus long and enlarged near apex. Face convex in lateral view. Forewing with five or six recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin rounded, anterior margin with rather narrow, median lobe. Plates short and sharply pointed. Paraphysis "T"-shaped, broadest at base, with apical, laterally projecting processes margined with tiny teeth. Aedeagus slender, about half as long as style, and with a pair of short apical processes. Style about three times as long as basal width, sinuate near middle, a large lobe on outer margin just before slender, pointed, outwardly curved, apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin almost straight and convergant, posterior margin with a wide, short median lobe.

Types: Holotype ♀, Tucson, Ariz., June 19, 1929, allotype ♂, Santa Rita Mts., May 12, 1929, E. D. Ball, in the National Museum, Washington, D. C.

Material Studied: (Arizona) Ruby, Santa Rita Mts., Huachuca Mts., Benson, Santa Catalina Mts. and Patagonia.

Host Plants: Ball (1932) writes "—taken as nymphs and adults from the live oaks of southern Arizona, especially *Q. oblongifolia* and *emoryi*."

Comparative notes: The female of this species is easily separated from *catalinus* and *huachucus* by the last ventral segment being unnotched, the male has the distinctive "T"-shaped paraphysis. This species was placed in *Hebenarus* DeLong but the great similarity of the genitalia of *ritanus* and *elegans* shows these two species very closely related and undoubtedly in the same genus.

9. *Scaphytopius* (*Scaphytopius*) *catalinus* (Ball)

Scaphoideus catalinus, Ball, E. D., Can. Ent., XLI: p. 82, 1909.

Resembling *ritanus* but smaller, clypeus somewhat darker than adjoining area of face and more distinct band on forewing. Length: female 5 mm., male 4 mm.

Color: Crown light fulvous with wedge and broad vitta on each side of median suture usually faintly indicated; faint black line along anterior margin. Pronotum slightly darker than crown, lightest along anterior margin; vittae usually indicated on margin. Scutellum orange with white spot at apex and another on each side near middle. Clypeus slightly darker than remainder of face, white line along basal margin between eyes; sharksmouth and two or three pairs of oblique lines beneath, light. Lorae, gena next clypeus below antennae and apical half of clypellus, ivory to light fulvous. Lateral margins of genae about same color as clypeus; light vittae behind eye and much shorter ones near ocellus and antennae usually at least indicated. Forewing hyaline or semihyaline brown on basal half, across middle of anteapical cells and apex, white to colorless in a band across base and apex of anteapicals, giving a two-banded appearance.

Structural Characteristics: Crown about as long as width between eyes, anterior margin straight to slightly convex on each side of bluntly pointed apex; wedge about one-fourth length of crown. Pronotum about as long as crown, two and one-half times as wide as length at middle and five times length behind eye; posterior margin concave with a small median notch. Clypeus slightly over one and one-half times as long as width at ocelli, lateral margin definitely sinuate at antennae. Clypeus long and enlarged near apex. Face in lateral view convex. Forewing with a few vein-like markings in brachial cell and eight or nine recurved veins to costa.

Genitalia: Valve almost one and one-half times as wide as length at middle, rounded on posterior margin, anterior margin with broad median lobe. Plates short but sharply pointed. Paraphysis bifid almost to base, each fork curved, long, and sharply pointed. Aedeagus almost as long as basal width, a sharp median process at apex, and a pair of lateral, apical processes, truncate and slightly produced anteriorly. Styles about three times as long as basal width, sinuate on basal third, large lobe on outer margin before a blunt, outward-projecting process on apical third.

Last ventral segment of female about twice as wide as greatest length, median notch on posterior margin reaching almost to base, forming two oval lobes.

Types: Holotype ♀, "Santa Rita Mts., Ariz. 5 to 8000 ft. June, F. H. Snow" in the National Museum, Washington, D. C. Allotype ♂ and four ♂ paratypes, Santa Rita Mts., Arizona, July 17, 1932, R. H. Beamer, here designated, in the Snow Entomological Collections. One other ♂ paratype—Santa Rita Mts., July 6, 1933, E. D. Ball.

Host Plants: Ball (1932) writes "—taken as nymphs and adults from the live oaks of southern Arizona, especially *Q. oblongifolia* and *emoryi*."

Comparative Notes: The deeply emarginate last ventral segment of the female is the best external criterion for separating this species from any other. This species has been listed in *Hebenarus* but the similarity of the genitalia of this species to *elegans* and *ritanus* would cause it to be retained in this genus.

10. *Scaphytopius* (*Scaphytopius*) *huachucus* (DeLong)

Hebenarus huachucus, DeLong, Pan-Pac. Ent., XXII: p. 41, 1944.

Resembling *catalinus* but larger, with darker clypeus and paraphysis bent near middle. Length: female 5.5 mm., male 5 mm.

Color: Crown yellow to orange with light markings, if present, as follows: thin line along anterior margin, wedge, long vitta on each side of median suture and an irregular area inside each eye. In many specimens collected in the summer, these markings are absent, while in fall or winter collected specimens, the markings are fuscous-lined and distinct. Pronotum usually slightly darker than crown, lightest along anterior margin; vittae usually absent, but sometimes indicated along lateral margins. Scutellum yellow to dark orange with white dot at apex and another on each lateral

margin. Clypeus much darker than remainder of face, orange, excepting fuscous bordered white line along basal margin between eyes, and white sharksmouth; sometimes oblique lines on disc faintly indicated. Remainder of face yellow to fulvous with vitta behind eye and spot near ocellus and antennae usually evident. In fall and winter specimens, the orange is replaced by dark brown and the remainder by light brown. Forewing hyaline brown on basal half, across middle of anteapical cells and in middle apical cell, remainder semihyaline white or colorless, giving a faintly two-banded appearance across apex of and base of anteapical cells.

Structural Characteristics: Crown only slightly longer than width between eyes, slightly convex on each side of a bluntly pointed apex; wedge about one-third length of crown. Pronotum almost as long as crown, about two and one-half times as wide as the length at middle and four and one-half times length behind eyes; posterior margin convex and with a small, broad median notch. Clypeus about one and two-thirds times as long as width at ocelli, lateral margin only slightly, if any, sinuate at antennae. Clypellus long and enlarged at apex. Forewings with numerous veins in brachial cell and numerous recurved veins on costa and usually extra veins on clavus.

Genitalia: Valve about as long as greatest width, posterior margin rounded; anterior margin with long median lobe. Paraphysis long, curved and almost parallel margined on basal two-thirds, split on apical two-thirds, with two pairs of short apical processes, one pair straight and the other recurved; another pair of short, straight processes on ventral margin on apical third where the paraphysis curves. Aedeagus small, ring-like, almost separated dorsally. Style less than three times as long as basal width, sinuate near middle, conspicuous lobe on outer margin before short, bluntly pointed, finger-like, apical process.

Last ventral segment of female straight on lateral margins; posterior margin with a deep median notch reaching almost to middle, forming two distinct lobes.

Types: Holotype ♂, allotype ♀, Huachucua Mts., Ariz., July 20, 1936, and June 9, 1935, J. N. Knull, in the DeLong collection, Ohio State University, Columbus, Ohio.

Material examined: (Arizona) Huachucua Mts., Chiricahua Mts., and Santa Rita Mts.

Host Plants: Unknown, but probably live oaks.

Comparative Notes: This species is placed in *Scaphytopius* because of its similarity to other members of this genus, most nearly related to *catalinus*, but larger and with darker frons.

SYNOPSIS OF SUBGENUS CLOANTHANUS BALL

Cloanthanus, Ball, E. D., Can. Ent., LXIII, p. 219, 1931.

The original description of this subgenus is as follows:

"Resembling *Platymetopius* (sens. strict.) but with a narrower vertex, a shark's mouth marking on frons, and two cross nervures. Closely related to *Platymoideus* but without the vermiculations on the anterior portion of elytra.

"Vertex flat, acutely angular, longer than wide, narrowing from the front of the eye to the base where it is very narrow. Face long, convex, acutely angled with vertex as seen from side. Front long and narrow especially below the antennae. Pronotum much broader than head. Venation regular, two cross nervures between sectors and numerous short reflexed veinlets to costa. The claval nervures are united by a cross nervure and usually tied to the suture by another one. The vertex, pronotum and anterior portion of elytra are usually unicolorous in sharp contrast to the dark venation on the posterior portion of elytra.

"Type of the genus *Platymetopius angustatus* Osb."

Additional characters of the subgenus are as follows: crown flat or depressed, usually pointed; forewing with anteapical cells almost the same length; numerous recurved veins to costa, darkest on outer anteapical and adjacent area of costa; lateral margins of clypeus straight to sinuate at antennae, sharksmouth usually present; clypellus parallel-margined or enlarged near apex, extending to, or slightly beyond, normal curve of genae; antennae in shallow pits near ventral margin of eyes.

Typical Color Pattern if Present: Crown with light markings as follows: Wedge; line along anterior margin; two pairs of spots on posterior margin, one pair near median suture and one spot next each eye; either three pairs of spots in a band across crown before eyes, or long straight or arcuate mark on each side of median suture (the band before eyes is usually present in short-crowned species, the long or arcuate markings usually in long-crowned species). Pronotum with seven vittae, one on median line and three on each side, usually more pronounced nearest lateral margins. Scutellum with light mark at apex, in each basal corner and on lateral margin half-way between apex and base; dark area inside each basal corner

and line across middle. Forewing variable, darkest on apical cells, outer anteapical cell and adjacent area of coastal cell. Clypeus with light, fuscous-margined sharksmouth near base. Genae darkest on lateral margins, fuscous-margined white vitta behind eye, two short vittae before eye, one near ocellus and another near base of antennae.

KEY TO SPECIES OF SCAPHYTOPIUS (CLOANTHANUS) BALL

1. Crown pattern absent, indistinct or consisting of two to three distinct light spots on disc of crown, sometimes coalesced or reduced, or forming a transverse band before the eyes, more or less complete, the median pair of spots often elongate; usually relatively short crown..... 2
 - Markings on crown taking the form of lineations, often arcuate, usually one long mark on each side of median suture; usually long crown..... 43
2. (1) Dorsum opaque yellow or fulvous to reddish, crown often darkest; scutellum without large dark area; crown parallel-margined or at most slightly angled; aedeagus long and with short, anteriorly projecting apical processes 3
 - Color and shape of crown not as above, or if so, aedeagus much different... 4
3. (2) Color yellow11. *nigricollis* (Ball), p. 443
 - Color fulvous to reddish12. *torridus* (Ball), p. 445
4. (2) Dorsum opaque white with fuscous markings; crown with irrorate dark area at apex and broken band between anterior half of eyes,
 13. *desertanus* (Ball), p. 446
 - Dorsum and crown not as above..... 5
5. (4) Four mm. or less in length; light markings on crown usually thin, the median pair often extending to base; last ventral segment of female much lighter than rest of venter; aedeagus with two short, erect apical processes on dorsal margin.....14. *irroratus* (Van Duzee), p. 447
 - More than four mm. in length; or if not, light markings on crown larger and shorter or aedeagus variable, but not as above..... 6
6. (5) Light fulvous, face with darker markings, especially in male: Arizona,
 15. *irroratus* subsp. *xanthanus* (Ball), p. 449
 - Not light fulvous; or if so, face without darker markings or not from Arizona 7
7. (6) Crown fulvous and short; face irrorate with brown throughout; Arizona,
 16. *irroratus* subsp. *nogalinus* (Ball), p. 450
 - Crown not as above; or if so, face not irrorate with brown throughout..... 8
8. (7) Entire face white or yellow in sharp contrast to much darker venter; no genital paraphysis in male 9
 - Face not as above; or if so, with genital paraphysis, although often small, 12
9. (8) Processes at apex of aedeagus at least half as long as shaft,
 17. *albifrons* Hepner, p. 452
 - Processes at apex of aedeagus less than half as long as shaft..... 10
10. (9) Light markings on crown slender; general color fuscous to black; aedeagus with short, erect apical processes at apex; Texas to California,
 18. *loricatus* (Van Duzee), p. 453
 - Light markings on crown broader; general color lighter; aedeagus not as above; Texas 11
11. (10) Aedeagus with wing-like apical processes.....19. *pennatus* Hepner, p. 455
 - Aedeagus with more slender, laterally-projecting apical processes,
 20. *flavifrons* Hepner, p. 457
12. (8) Light band on crown before eyes complete except for two or three fine dark lines; many tiny fine dots and vermiculations more or less evenly distributed throughout forewing; aedeagus long and abruptly curved on apical third21. *amisacanus* (Ball), p. 458
 - Crown and forewing not as above; or if so, aedeagus much different..... 13

13. (12) Forewings translucent greenish-fulvous, crown mostly light except for irregular brown band between anterior margin of eyes; southern Texas,
22. *contractus* Hepner, p. 459
Forewings and crown not as above; or if so, not from southern Texas..... 14
14. (13) Dorsum brown with ivory markings; face infuscated on lateral margins; aedeagus broad and enlarged at apex, small paraphyses,
23. *brunneus* Hepner, p. 460
Dorsum and face not as above, or if so, with different genitalia..... 15
15. (14) Male plates truncate at apex; female last ventral segment broadly concave with a slender median notch; face dark..... 16
External genitalia not as above, or if so, face not dark..... 18
16. (15) Crown evenly irrorate with light, no band before eyes,
24. *fuscifrons* (Van Duzee), p. 461
Crown with a band before the eyes..... 17
17. (16) Area of crown next pronotum with some dark markings, especially next eye, four and one-half mm. or more in length,
25. *fuscifrons* subsp. *compactus* (Ball), p. 463
Area of crown next pronotum without dark markings, less than four and one-half mm. in length..... 26. *fuscifrons* subsp. *minutus* Hepner, p. 464
18. (15) Face bright yellow throughout, dorsum light fulvous... 27. *dodonanus* (Ball), p. 466
Face not bright yellow throughout; or if so, dorsum not light fulvous..... 19
19. (18) Crown with light band before eyes and at base, giving a more or less distinct four-banded appearance—two ivory and two fuscous; forewings not distinctly darkened at apex..... 28. *celtidus* (Ball), p. 467
Crown not as above; or if so, forewings darkened at apex..... 20
20. (19) Forewings semihyaline white with many dark dots throughout; scutellum with large area next each basal corner; erect genital paraphyses extending slightly beyond simple aedeagus..... 29. *californiensis* Hepner, p. 468
Forewings and scutellum not as above; or if so, genitalia different..... 21
21. (20) Light band before eyes broad, distinct and almost complete; remainder of crown black except for apical wedge and irrorations next pronotum..... 22
Crown not as above 23
22. (21) Scutellum primarily black..... 30. *diabolus* (Van Duzee), p. 470
Scutellum with few, if any, black markings..... 31. *pallidiscutus* Hepner, p. 472
23. (21) Clavus of forewing semihyaline fulvous without darker markings; genital paraphyses of male bifid on outer third..... 24
Clavus not as above, or if so, paraphyses different..... 25
24. (23) Pronotum fulvous 32. *fulvus* (Osborn), p. 473
Pronotum fuscous..... 33. *fulvus* subsp. *collaris* (Sand. and DeLong), p. 475
25. (23) Clypeus bright yellow and without markings on apical two-thirds; outer margin of lorae infuscated; forewings blackish,
34. *frontalis* (Van Duzee), p. 476
Face and forewings not as above..... 26
26. (25) Crown heavily irrorate, but without definite pattern..... 27
Crown not heavily irrorate; or if so, with pattern..... 28
27. (26) Scutellum fulvous and with few or no fuscous or black markings,
35. *cinnamomeus* (Osborn), p. 477
Scutellum dark, with fuscous or black markings throughout,
36. *deltensis* Hepner, p. 479
28. (26) Crown and face ivory and without markings..... 37. *dorsalis* (Ball), p. 480
Crown or face with darker markings..... 29
29. (28) Entirely dark fuscous to blackish, except for small light marks on crown,
38. *nigrifrons* (DeLong), p. 481
Not entirely fuscous to blackish..... 30
30. (29) Forewings fulvous with large milky spots throughout,
39. *amplinotus* Hepner, p. 482
Forewings not as above 31
31. (30) Crown only slightly longer at middle than next eye and only slightly longer than width between eyes..... 40. *osborni* (Van Duzee), p. 483
Crown distinctly longer at middle than next eye..... 32

32. (31) Crown fulvous and without dark markings and with a distinct spot on each side of median suture on disc; entire dorsum about same color; Florida, 41. *andromus* (Ball), p. 485
Crown and dorsum not as above, or if so, not from Florida..... 33
33. (32) Crown more than twice as long as width between eyes, 42. *verecundus* (Van Duzee), p. 486
Crown shorter than above..... 34
34. (33) Dorsum reddish-brown, markings on crown small, but distinct, 43. *insolitus* Hepner, p. 487
Dorsum and crown not as above..... 35
35. (34) Aedeagus notched along dorsal margin; eastern..... 36
Aedeagus tube-like; western (except *angustatus*)..... 38
36. (35) Genital paraphysis with small pointed, lateral lobe near middle, 44. *magdalenensis* (Provancher), p. 488
Genital paraphysis without lobe; or if present, nearer apex..... 37
37. (36) Light band before eyes only about half complete; not Florida, 45. *scriptus* (Ball), p. 490
Light band before eyes on crown almost complete; Florida, *scriptus* subsp. *meridianus* Hepner, p. 492
38. (35) Color greenish-yellow; eastern..... 47. *angustatus* (Osborn), p. 493
Color not greenish-yellow; western 39
39. (38) Scutellum primarily ivory to orange, with black markings; remainder of dorsum black 48. *calliandrus* (Ball), p. 494
Scutellum not marked as above; dorsum lighter..... 40
40. (39) Dorsum white with dark dots; face with only scattered dark dots, 49. *analisis* var. *castranis* (Ball), p. 496
Dorsum and face not as above..... 41
41. (40) Crown dark brown with marks before the eyes thin and directed toward apex; aedeagus relatively long..... 50. *radiatus* Hepner, p. 497
Crown and aedeagus not as above..... 42
42. (41) Aedeagus very short; styles more than twice as long as greatest width; crown almost same color throughout..... 51. *modicus* Hepner, p. 498
Aedeagus longer; styles less than twice as long as greatest width, 52. *pallidicapitatus* Hepner, p. 499
43. (1) Forewing with only green or brown clouded area on anterior half; usually four or less dark reflexed veins to costa..... 44
Forewings with vermiculations or dots on anterior half; usually more than four reflexed veins to costa..... 45
44. (43) Color greenish 53. *nigriviridis* (Ball), p. 500
Color brownish 54. *nigriviridis* subsp. *dixianus* (Ball), p. 502
45. (43) Crown white, with a large black mark around and behind wedge; forewings opaque white with sparse fuscous vermiculations... 55. *heldoranus* (Ball), p. 503
Crown and forewings not as above..... 46
46. (45) General color pale gray; crown short; Southwest, 49. *analisis* var. *castranus* (Ball), p. 496
Color and crown not as above, or if so, not Southwest..... 47
47. (46) Fuscous-margined, light vitta on clypeus from near sharksmouth to near apex 56. *vittifrons* Hepner, p. 504
Without such a line on clypeus..... 48
48. (47) Color pale fulvous, except for dark area over most of pronotum and basal half of scutellum..... 33. *fulvus* subsp. *collaris* (Sanders & DeLong), p. 475
Color various, but not as above..... 49
49. (48) Arcuate markings very indistinct or absent..... 50
Arcuate or long discal markings more distinct..... 51
50. (49) Forewings greenish-fulvous with dark veins restricted to apical half, 47. *angustatus* (Osborn), p. 493
Forewings brownish 35. *cinnamomeus* (Osborn), p. 477
51. (49) Crown light fulvous with few or no fuscous markings; crown of female at least two and one-half times as long as width between eyes; that of male almost as long..... 57. *slossonae* (Van Duzee), p. 505
Crown not as above..... 52

52. (51) Color dark reddish brown; face dark and in lateral view distinctly concave 53. *rubellus* (Sanders and DeLong), p. 507
Color not as above 53
53. (52) Pronotum yellowish, forewing semihyaline light with veins and markings consisting primarily of dots; crown with many vermiculations,
59. *cinereus* (Osborn and Ball), p. 503
Pronotum, forewing and crown not as above..... 54
54. (53) Face unmarked yellow, at least on disc of clypeus..... 55
Face dark, even on disc of clypeus..... 64
55. (54) Dorsum white with veins and markings consisting primarily of dots; crown with many vermiculations..... 60. *guterranus* (Ball), p. 510
Dorsum and crown not as above..... 56
56. (55) Pygofer of male broadly concave on basal half of outer margin; face yellow on disc 61. *acutus* (Say), p. 511
Pygofer of male not as above, or if so, face not yellow on disc..... 57
57. (56) Entire dorsum fulvous; crown less than one and one-half times width between eyes 62. *oregonensis* (Baker), p. 513
Dorsum and crown not as above..... 58
58. (57) Crown long, darkest on disc with arcuate markings pale or indistinct,
63. *latus* (Baker), p. 515
Crown not as above 59
59. (58) Aedeagus in ventral view much smaller at apex than at base; eastern,
64. *argutus* DeLong, p. 516
Aedeagus not as above, or if so, not eastern..... 60
60. (59) Crown primarily dark brown to fuscous..... 65. *fuscicephalus* Hepner, p. 517
Crown lighter colored 61
61. (60) Crown greenish or light fulvous; southern..... 66. *viridicephalus* Hepner, p. 519
Crown not as above, or if so, not southern..... 62
62. (61) Aedeagus broad; genital paraphyses enlarged on apical two-fifths,
67. *utahensis* Hepner, p. 520
Aedeagus slender; genital paraphyses, if enlarged, only on outer fourth.... 63
63. (62) Less than five and one-half mm. in length..... 68. *graneticus* (Ball), p. 521
More than five and one-half mm. in length..... 69. *canus* Hepner, p. 523
64. (54) Crown at least two and one-half times as long as width in female; twice as long as width in male, very slender; crown mottled, with three to five distinct lines 65
Crown not as above 66
65. (64) Plates truncate, aedeagus long..... 70. *trilineatus* (Ball), p. 524
Plates pointed, aedeagus short..... 72. *trilineatus* subsp. *spicatus* Hepner, p. 525
66. (64) Less than four mm. in length; face lighter on disc of clypeus than on genae 72. *abbreviatus* (DeLong), p. 527
More than four mm. in length; face about same color throughout,
73. *triangularis* DeLong, p. 529

11. *Scaphytopius* (*Cloanthanus*) *nigricollis* (Ball)

Platymetopius nigricollis, Ball, E. D., Ent. News, XXVII, p. 205, 1916.

Resembles *torridus* but yellow with a dark crown and mottled face. Length: female 4 mm., male 3.5 mm.

Color: Crown yellow and brown mottled, area next pronotum, apical wedge and a spot on each side, light. Sometimes the dark is somewhat reduced. Pronotum and scutellum bright yellow with sometimes a few scattered dark spots. Face yellow and brown mottled, sharksmouth small, vitta behind eye distinct. Forewings semihyaline white to yellow, usually with small dark dots throughout; veins yellow, usually darker at apex and along costal margin.

Structural Characteristics: Crown only slightly longer than width between eyes, almost parallel-margined in male, more produced in female. Pronotum about as long as crown, two and one-half times as wide as length at middle and five times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, only slightly broader at base than at antennae. Face distinctly convex in lateral view. Forewing with venation typical; about nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin somewhat convex on each side of a rounded apex; anterior margin with a broad, rather flat, median lobe. Plates slender. Aedeagus "J"-shaped, with dorsal portion quite broad and about two-thirds as long as shaft, which is slender and with a pair of short, anterio-dorsally projecting, sharply pointed processes; base short. Styles about four times as long as basal width, sinuate at middle, only slightly lobed on outer margin before short, curved, finger-like apical process.

Last ventral segment of female about one and two-thirds as wide as length at middle, lateral margins straight and slightly converging, posterior margin straight to slightly concave on each side of prominent median lobe, notched at middle.

Types: Lectotypes ♀, Mojave, California, July 30, 1912, lectoallotype ♂, St. George, Utah, E. D. Ball, here designated, in the National Museum, Washington, D. C.

Material Studied: (Utah) St. George. (Arizona) Vail, Tucson, Congress Junction, Alamo, Yarnell, Black Mts., Santa Rita Mts., Chiricahua Mts., Empire Mts. and Mt. Graham. (New Mexico) Alamogordo, Rodeo and Socorro Co. (Texas) Presidio Co., Ft. Stockton and 65 miles south of Marathon.

Host Plants: Ball (1932) writes "—found as nymphs and adults on the creosote bush (*Larrea tridentata*) in southern Utah and Arizona."

Comparative Notes: In some specimens the dark dots are absent, only the crown being colored. This species might possibly be confused with a male *nigriviridis*, but is much broader, with a shorter crown and more dark on the crown.

Nigricollis was made genotype for the genus *Convelinus*, but there is no good structural difference to separate it from other *Cloanthanus*. In fact, *castranus*, mentioned by Dr. Ball as belonging to *Convelinus*, has genital structures like typical *Cloanthanus*, with

paraphyses. Although *nigricollis* and *torridus* have similar genital structures and feed on the same host plant, no evidence of hybridization has been noted.

12. *Scaphytopius (Cloanthanus) torridus* (Ball)

Platymetopius brevis var. *torridus*, Ball, E. D., Ent. News, XXVII, p. 205, 1916.

Resembles *nigricollis* but dark fulvous to reddish-brown with different pattern on crown. Length: female 3.5 mm., male 3.2 mm.

Color: Crown usually tan and white mottled; spot on posterior margin next each eye, line on each side median suture broadest at base, irregular band before eye, and small apical wedge, light. Pronotum about same color as crown, sometimes a series of white marks along anterior margin. Scutellum same color as crown, with typical light markings at least indicated. Face mottled brown and fulvous, lightest on lorae; small sharksmouth and light vitta behind eye, distinct. Some specimens are mottled brown and red.

Structural Characteristics: Crown about as long as width between eyes in male, slightly longer in female; wedge very short. Pronotum only slightly shorter than crown, about two and one-half times as broad as length at middle, five times as broad as length behind eyes. Clypeus about twice as long as width at ocelli; only slightly sinuate at antennae. Clypellus stout, only slightly enlarged at apex. Forewing with typical venation, seven or eight indistinct, recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin somewhat convex on each side of a bluntly pointed apex; anterior margin with a broad, short median lobe. Plates slender. Aedeagus "J"-shaped with dorsal portion broad and about two-thirds as long as shaft, which is slender, and a pair of dorso-anteriorly projecting, short, apical processes; base short. Styles about four times as long as greatest width, almost parallel-margined to finger-like apical process.

Last ventral segment of female almost twice as wide as length at middle, lateral margins slightly convex, posterior margin distinctly convex.

Types: Lectotype ♀, Calxico, Calif., June 18, 1909, E. D. Ball, here designated, in the National Museum, Washington, D. C. Allotype ♂, Big Bear Lake, Calif., July 26, 1932, R. H. Beamer, here designated, in the Snow Entomological Collections. Parallotype ♂♂ as follows: (California) 2, Barstow, June 1, 1935, P. W. Oman; 3, Jacumba, Aug. 12, 1935, R. H. Beamer; 1, Jacumba, May

18, 1941, D. J. and J. N. Knull; 1, Ontario, June 12, 1908; 6, Kelso, June 9, 1908, E. D. Ball; 1, Palm Spgs., Sept. 2, Hubbard; 2, Indio, June 4, 1935, P. W. Oman; 1, Holtville, June 1, 1935, P. W. Oman; 1, El Centro, June 1, 1935, P. W. Oman; and 1, San Diego Co., Coquillet. (Nevada) 2, Las Vegas, March 7, 1934, 1, April 28, 1934, E. W. Davis. (Utah) 2, St. George, Sept. 8, 1930, E. W. Davis and 1, "Dixie," Aug. 8, 1915, E. D. Ball. (Arizona) 1, Littlefield, Sept. 10, 1930, 1, June 7, 1931, E. W. Davis; 2, Black Mts., July 13, 1932, R. H. Beamer; 1, Congress Jct., Aug. 27, 1935, E. D. Ball; 2, Cong. Jct., June 14, 1937, D. J. and J. N. Knull; 1, Wickenburg, May 31, 1935, P. W. Oman; 2, Empire Mts., Aug. 18, 1935, E. D. Ball; 1, Gila Bend, June 8, 1931; 1, Yuma, Aug. 25, 1929, 1, Oct. 30, 1931, 2, Nov. 1, 1931, E. D. Ball; 2, Mohawk, Oct. 29, 1931; 1, Ajo Mts., Apr. 20, 1935, 4, July 22, 1937, E. D. Ball; 4, Tucson, May 31, 1929, 1, July 24, 1930, E. D. Ball; 1, Pima Co., July 27, 1927, R. H. Beamer; 1, Cochise, Aug. 24, 1935, R. H. Beamer and 1, Santa Rita Mts., June 8, 1937, D. J. and J. N. Knull.

Host Plants: Ball (1932) writes "—confined to the creosote bush." The author has examined specimens collected from *Larrea tridentata*, *Larrea mexicana* and *Covillea tridentata*, probably different names for the same plant.

Comparative Notes: Unlike *nigricollis*, this species is about the same color throughout. It varies considerably both in size and color. It was originally described as a variety of *brevis*, a Jamaica species, but apparently differs considerably from that species.

13. *Scaphytopius (Cloanthanus) desertanus* (Ball)

Nasutoideus desertanus, Ball, E. D., Can. Ent., LXIII, p. 225, Oct., 1931.

Resembles *heldoranus*, but with irregular black markings between anterior part of eyes, forming a dark, incomplete band; without genital paraphyses. Length: female 3.5 mm., male 3.3 mm.

Color: Crown white except for irregular black markings around wedge, irregular black markings inside anterior margin of each eye and usually two to four lines connecting these two dark areas. Pronotum milky semihyaline, sparsely marked with dark dots, vittae usually faintly indicated. Scutellum white to fulvous with usually a few dark vermiculations on basal half. Face ivory with a few dark dots or vermiculations in area of small sharksmouth and along lateral margin; apex of clypellus dark. Forewing milky translucent with sparsely spaced fuscous dots, especially along veins; apical cells clouded; veins in costa dark.

Structural Characteristics: Crown almost twice as long as width between eyes in female, shorter in male, anterior margin somewhat convex on each side of bluntly pointed apex. Pronotum two-thirds as long as crown in female, three-fourths as long in male; about two and one-half times as wide as length at middle, slightly over four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli in male, slightly longer in female, only slightly sinuate near antennae. Face convex in lateral view. Forewing with venation typical and about nine or ten recurved veins to costa.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin rounded; anterior margin with broad, short, median lobe. Aedeagus "J"-shaped, dorsal part broadest, shaft narrowed and slightly curved to a pair of small, apical processes. Style only slightly over twice as long as basal width, outer margin with distinct lobe before laterally projecting, finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, latero-posterior margin rounded, without median lobe or notch.

Types: Holotype ♀, allotype ♂, Tucson, Arizona, May 5, 1929, E. D. Ball, in the National Museum, Washington, D. C. One pair of paratypes, Tucson, Arizona, Aug. 31, 1929, E. D. Ball, were on hand for study.

Additional Material Studied: (Arizona) Wickenburg, Sentinel, Coolidge Dam, Granite Dell, Glenn Oaks, Apache Jct., Phoenix and Littlefield. One specimen collected by Dr. Ball at Brownsville, Texas, on the same pin with a *castratus* specimen may be mislabelled, as no other specimen has been seen from east of Arizona.

Host Plants: Dr. Ball (1932) writes "—found breeding abundantly on the gray bur sage (*Franseria deltoides*) in Arizona."

Comparative Notes: This small gray species is easily recognized by its small size and color. It can be easily separated from *heldoranus* by the dark irrorate area at apex of crown, whereby *heldoranus* has a solid black area at apex of crown.

14. *Scaphytopius (Cloanthanus) irroratus* (Van Duzee)

Platymetopius irroratus, Van Duzee, E. P., Ann., Ent. Soc. Amer., III, p. 227, 1910.

Resembles *loricatus*, but with dark face and with aedeagus produced on dorsal margin. Length: Female 4 mm., male 3.6 mm.

Color: Crown mottled brown and light with light markings as follows: Wedge. thin line along anterior margin; three pairs of clon-

gate spots forming an incomplete band before eyes, and two pairs of spots on posterior margin, one pair next median suture (often joined to median spots of band before eyes) and one next each eye. Pronotum about same color as crown, light vittae usually at least faintly indicated. Scutellum fulvous to brown with typical light markings. Face of male fulvous with brown to fuscous markings throughout, darkest on lateral margins of genae, lightest in area next lorae and broad line behind eye; sharksmouth small but usually distinct. Face of female usually lighter. Forewing brown to fuscous, veins and irrorations darker at apex and costal area opposite apex of clavus. Often the fulvous coloration is lacking and forewing is merely white with dark markings.

Structural Characteristics: Crown about as long as width between eyes in male, longer in female, margins slightly convex to a dull point in male, margins more convex in female; wedge one-third to one-fourth as long as crown. Pronotum about three-fourths as long as crown, about two and one-half times as broad as length at middle. Clypeus over twice as long as width at ocelli, only slightly sinuate at antennae. Forewing with eleven or twelve recurved veins to costa.

Genitalia: Valve about three-fourths as long as greatest width, posterior margin somewhat convex on each side to a bluntly pointed apex; anterior margin concave on each side of a relatively narrow median lobe. Plates broadest near base, apices relatively short and slender. Aedeagus roughly "U"-shaped with a broad process and smaller shaft, slightly narrowed to apex with a pair of dorsal apical processes; base shorter than shaft. Styles distinctly less than twice as long as greatest width, narrowest near middle, large lobe on outer margin before finger-like apical process.

Last ventral segment of female somewhat over half as long as greatest width, latero-posterior margin rounded.

Types: Lectotype ♂, Tía Juana, México, June 15, 1908; lectoallotype ♀, San Diego, Calif., June 16, 1908, E. D. Ball, here designated, in the National Museum, Washington, D. C. These were on hand for study.

Additional Material Studied: (California) Irvine Hills, Orange Co., San Diego Co., Anaheim, Sunset Beach, Bonsail, La Jolla, Monrovia, Alpine, Laguna Beach, Otay, Lemon Cove, Escondido, Quatay, Lakeside, Los Angeles, Riverside, Pasadena, Santa Barbara, Osnard, Ontario, Redding and Santa Monica. (Arizona) Tucson, Phoenix, Patagonia, Chiricahua Mts., Granite Dell, Yuma and

Bangs. (New Mexico) Blue Spgs. and Carlsbad. (Texas) San Juan, Presidio, Del Rio, Brownsville, Pecos, Sutton Co., Bee Co., Premont Co., Ft. Stockton, Ozona, Kendall Co., Karnes Co., El Paso Co., Valentine, Hidalgo, Sarita, McAllen, Corpus Christi, Laredo, Jim Wells Co., Concan, Carrizo Spgs., George West, Sheffield, Sanderson, San Ygnacia, Comstock, Bexar Co., Ft. Davis, Catarina, Marfa and Marathon.

Host Plants: A large series were collected at Bonsail, California, by R. H. Beamer on *Ambrosia* sp. Other collection data give *Eysenhardia texana* at Sanderson, Tex., peach foliage at El Paso and Bexar Co., Texas, *Amaranthus* sp. in Bexar Co., Texas, and adults and nymphs on *Heterotheca subaxillaris* in Bexar County. The large series from *Ambrosia* in California and the presence of nymphs on *H. subaxillaris* in Texas would suggest one of these two plants as the normal host.

Comparative Notes: As might be expected from its wide distribution, this species varies considerably both in color and size. Color varies from fulvous to dark gray, with the entire dorsum about the same color; the face varies from total infuscation to markings only along the lateral margins. The small size and usually dark face will separate it from most species found along the southern part of the United States from California to Texas, where it is one of the most common species in the genus.

15. *Scaphytopius (Cloanthanus) irroratus xanthanus* (Ball)

Nasutoideus xanthanus, Ball, E. D., Can. Ent., LXIII, Oct., p. 225, 1931.

Resembles *irroratus* but lighter in color, larger and with a blunter crown. Length: female 4.2 mm., male 4 mm.

Color: Crown fulvous with light markings as follows: wedge, narrow line along anterior margin, two pairs of large, rather elongate spots on each side before eye; a long, broad line from near wedge to base on each side of median suture and a small spot on posterior margin next each eye. Pronotum lighter than crown, vittae usually faintly visible. Scutellum ivory to fulvous with typical light markings usually evident, especially in male. Face of male pale fulvous with brown irrorations, especially behind eyes and on basal half of clypeus, lighter in female; sharksmouth and line behind eye usually distinct. Forewing semihyaline pale fulvous with large milky aeroles throughout, usually a few brown dots scattered throughout; veins darkest on posterior and costal margins.

Structural Characteristics: Crown about one and two-thirds times as long as width between eyes, anterior margin convex on each side of a blunt apex, less convex and more pointed in the female; wedge short. Pronotum somewhat shorter than crown; about two and one-half times as wide as length at middle and about four and one-half times as wide as length behind eyes. Clypeus somewhat over twice as long as width at ocelli, only slightly sinuate near antennae. Clypellus relatively slender and broadest near apex. Face in lateral view slightly convex. Forewing with venation typical and nine or ten recurved veins to costa.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin broadly rounded, very broad at middle; anterior margin distinctly concave on each side of a rounded median lobe. Plates relatively narrow. Aedeagus "J"-shaped with dorsal portion slightly largest, shaft slender, almost parallel-margined to apex, which bears a pair of slender dorsal processes and smaller, spine-like dorsal processes; base short. Styles less than twice as long as greatest width, narrowest on basal third, broadly lobed on median third before an apical, finger-like process.

Last ventral segment of female almost twice as wide as length at middle, latero-posterior margin almost evenly rounded.

Types: Holotype ♀, allotype ♂, Tucson, Arizona, May 10, 1929, E. D. Ball, in the National Museum, Washington, D. C.

Material Studied: (Arizona) Sabino Canyon, Ajo, Tucson and Apache Jct.

Host Plants: Ball (1932) writes "—exclusively on the bur sage (*Franseria ambrosioides*) in Arizona."

Comparative Notes: This species resembles *nogalinus* rather closely, but may be separated by its lighter color, slightly larger size and longer crown.

16. *Scaphytopius (Cloanthanus) irroratus nogalinus* (Ball)

Nasutoideus irroratus var. *nogalinus*, Ball, E. D., Can. Ent., LXIII, p. 226, Oct., 1931.

Resembles *irroratus* but larger, lighter in color and with a shorter crown. Length: female 4 mm., male 3.8 mm.

Color: Crown fulvous irrorate with light, with white markings as follows: narrow line along anterior margin, wedge, two or three pairs of elongate dots in an area around wedge, two pairs of dots on posterior margin, a small pair next eyes and a longer pair near median suture. Pronotum fulvous with dark dots, milky vittae

usually distinct. Scutellum yellow to fulvous with typical ivory markings. Face ivory to fulvous with brown irrorations, usually lightest in area of clypellus and lorae; sharksmouth and vitta behind eye distinct. Forewing semihyaline pale fulvous with large milky aeroles throughout, veins dark, especially in costal area.

Structural Characteristics: Crown over two-thirds as wide as length at middle, almost parallel-margined in male, longer in female; wedge short. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and four times as wide as length behind eyes. Clypeus slightly over twice as long as width at ocelli, only slightly sinuate at antennae. Clypellus relatively slender and only slightly enlarged at apex. Forewing with several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve slightly less than two-thirds as long as greatest width, posterior margin rounded; anterior margin with long median lobe. Plates broadest near base, narrow on outer half. Aedeagus "U"-shaped, base slender, dorsal part broadest, shaft curved, with a pair of erect apical processes from dorsal margin. Styles slightly less than twice as long as greatest width, sinuate near middle, lobed on outer margin just before outward projecting, finger-like apical process.

Last ventral segment of female about half as long as greatest width, latero-posterior margin rounded.

Types: Holotype ♀, allotype ♂, Santa Rita Mts., Arizona, June 22, 1930, E. D. Ball, in the National Museum, Washington, D. C. A pair of paratypes, Tucson, Arizona, June 9, 1929, E. D. Ball, were on hand for study.

Additional Material Studied: (Arizona) Rincon Mts., Patagonia, Santa Rita Mts., Ajo Mts., Sabino Canyon, Santa Catalina Mts., Baboquivara Mts., Mustang Mts., Ruby, Huachucua Mts., Tubac and Chiricahua Mts.

Host Plants: Ball (1932) writes "—beaten in small numbers from oaks on the lower slopes of the mountains in southern Arizona. The small numbers and lack of nymphs would suggest that the adults may have flown up from some plant growing beneath the trees."

Comparative Notes: This species is easily recognized by its short, light crown and dark face.

17. *Scaphytopius (Cloanthanus) albifrons* Hepner

Scaphytopius (Cloanthanus) albifrons, Hepner, L. W., Jour. of Kan. Ent. Soc., XIX, p. 89, 1946.

Resembling *loricatus* but smaller, lighter in color, and with long processes at apex of aedeagus. Length: female 4.1 mm., male 3.9 mm.

Color: Crown mottled brown with light markings as follows: wedge, narrow line along anterior margin, three pairs of spots before eyes, the outer largest and the inner long and slender; two pairs of spots along posterior margin, a large pair next median suture and another pair behind eyes. Pronotum semihyaline fulvous with fuscous dots throughout except for distinct vittae. Scutellum yellow to dark fulvous with typical markings light. Face ivory to yellow with sometimes a few brown marks in area of sharksmouth and dots along lateral margins of genae, especially behind eyes; apex of clypellus black. Strangely enough, the dark specimens from Florida lack all facial color except black tip of clypellus. Specimens collected in Texas in the winter usually have the facial markings. Forewing semihyaline fulvous with brown veins and large milky aeroles throughout. In most specimens from Florida, the fulvous is replaced by brown to black.

Structural Characteristics: Crown one and two-thirds as long as width between eyes in female, somewhat shorter in male, slightly convex on outer margins, rather sharp pointed at apex, especially in female. Pronotum about three-fifths as long as crown in female, slightly longer in male, almost three times as wide as length at middle and four times length behind eye. Clypeus over twice as long as width at ocelli, lateral margin broadly concave near middle. Clypellus broadest near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewing with outer claval vein approaching second claval vein at crossvein, usually numerous vein-like markings in brachial cell; about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin rounded, anterior margin narrowed to a broadly rounded lobe at middle. Plates wide near base, apical portion relatively short and slender. Aedeagus "J"-shaped, shaft longer than base, broadly curved, almost parallel-margined with a pair of long slender, apical processes almost two-thirds as long as shaft. Styles about twice as long as greatest width, outer margin concave on basal third, small lobe before finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex, posterior margin evenly produced, but only slightly longer at middle than at sides.

Types: Holotype ♂, allotype ♀, 24 ♀ and 9 ♂ paratypes, Brownsville, Texas, Dec. 27, 1945, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Texas) 1 ♀, 3 ♂♂, Brownsville, Jan. 2, 1932, 1 ♂, Jan. 3, 1932, E. D. Ball; 7 ♀♀, 8 ♂♂, Brownsville, May 31, 1933, P. W. Oman; 10 ♀♀, 1 ♂, Brownsville, Dec. 29, 1945 (in palm forest), R. H. Beamer; 1 ♂, Brownsville, Aug. 8, 1937, D. J. and J. N. Knull; 1 ♂, Hidalgo, July 30, 1938, 19 ♀♀, 1 ♂, Dec. 28, 1945, R. H. Beamer; 1 ♀, Hidalgo, July 28, 1928, A. M. James; 2 ♀♀ and 1 ♂, Cameron Co., Aug. 3, 1928, R. H. Beamer. (Florida) 2 ♂♂, 1 ♀, Wakulla, July 10, 1939, R. H. Beamer; 1 ♂, Fruitland, Aug. 11, 1930, R. H. Beamer; 2 ♂♂, Sanford, Nov. 18, 1926, 1 ♂, June 22, 1926, E. D. Ball; 4 ♀♀, 1 ♂, Tampa, Oct. 17, 1925, E. D. Ball; 1 ♀, Cocoa, May 5, 1926, E. D. Ball; 2 ♀♀, La Belle, July 16, 1939, R. H. Beamer; 1 ♀, La Belle, July 16, 1939, P. B. Lawson; 2 ♀♀, La Belle, July 16, 1939, P. W. Oman; 1 ♂, La Belle, April 21, 1921, D. M. DeLong; 1 ♂, Likely, July 24, 1934, R. H. Beamer; 1 ♂, Naples, May 14, 1928, E. D. Ball; 2 ♂♂, Miami, April 1, 1921, D. M. DeLong; 1 ♂, Homestead, May 16, 1926, E. D. Ball; 1 ♀, Paradise Key, April 8, 1921, D. M. DeLong and 1 ♂, Key West, July 20, 1939, R. H. Beamer.

Host Plants: No host plant is known.

Comparative Notes: This is apparently the only species in Florida in which the face is entirely light. In Texas, however, this species is easily confused with *loricatus* and *pennatus* but the male genitalia easily separate them. *Albifrons* was described by DeLong (1943) as *loricatus* but that species, described from California, extends only into Texas, and this species, distinctly different, is also found in Florida.

18. *Scaphytopius (Cloanthanus) loricatus* (Van Duzee)

Platymetopius loricatus, Van Duzee, E. P., Bull. of Buffalo Soc. Nat. Hist., V, p. 205, 1894.

Resembling *frontalis*, but more slender, with a sharper crown, face with few or no dark markings and without genital paraphyses in the male. Length: female 4.5 mm., male 4 mm.

Color: Crown brown with light markings as follows: wedge, a thin line along anterior margin, two pairs of slender marks before

eyes and a line on each side of median suture joining or almost joining a pair of spots at base next median suture; a spot on posterior margin next each eye. Pronotum irrorate with brown, slightly darker than crown, with pale vittae distinct. Scutellum yellow to brown with typical light markings. Face yellow to light fulvous, much lighter than adjoining area of venter, sometimes a few indistinct darker markings in area of sharksmouth and at apex; line behind eye sometimes faintly indicated; apex of clypellus dark. Forewing brown to fuscous with milky aeroles throughout, especially in costal cell.

Structural Characteristics: Crown in male about one and two-thirds as long as width between eyes, slightly longer in female, almost straight on each side of a rather blunt apex. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and about three and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, narrowing evenly to clypellus on apical three-fourths; clypellus broadest near apex. Face in lateral view almost straight, sometimes slightly concave between anterior margin of eyes of female. Forewing with venation typical, a few marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve over two-thirds as long as greatest width, posterior margin broadly rounded; anterior margin concave on each side of a truncate median process. Aedeagus "J"-shaped, shaft almost as long as plates, parallel margined to abruptly curved portion on apical two-fifths, then narrowed to a pair of erect processes on ventral side and a much shorter process on dorsal side; base short. Styles less than twice as long as greatest width, evenly narrowed from base to middle, distinct lobe on outer margin before outwardly projecting, bluntly pointed, apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, posterior margin broadly convex without lobes or notches.

Types: Lectotype ♂, California, Coquillett, in the Iowa State College collection, Ames, Iowa. Allotype ♀, Brea, California, July 29, 1935, R. H. Beamer, here designated, in the Snow Entomological Collections. Parallotype ♀ ♀ as follows: (California) 1, Alpine, July 9, 1929, R. H. Beamer; 1, Lompoc, Aug. 7, 1938, R. I. Sailer; 4, Laguna Beach, Orange Co., Aug. 10, 1931, Billie Moore; 2, Pasadena, June 17, 1908, E. D. Ball; 1, Santa Barbara, April 25, 1908, E. D. Ball; 1, Los Angeles, P. R. Uhler; 1, Los Angeles Co., Coquillett

and 1, San Diego Co., July 4, 1929, R. H. Beamer. (Arizona) 1, Patagonia, June 24, 1933, 3, Aug. 22, 1935, 1, Aug. 21, 1935, R. H. Beamer; 7, Patagonia, Sept. 7, 1929, 3, Aug. 8, 1930, 1, Oct. 5, 1935, 4, Sept. 10, 1933, E. D. Ball; 10, Patagonia, Oct. 23, 1937, P. W. Oman; 4, Tucson, June 23, 1929, 1, May 23, 1929, 1, Sept. 20, 1929, 1, June 28, 1930, 1, July 16, 1935, E. D. Ball; 4, Mesa, Sept. 10, 1938, 1, Dec. 16, 1939, Christensen; 11, Santa Cruz River, near Tubac, Oct. 23, 1937, P. W. Oman; 6, Santa Cruz Valley, Sept. 6, 1937, E. D. Ball; 2, Santa Cruz River, July 30, 1937, E. D. Ball; 1, Patagonia Mts., Aug. 20, 1940, D. J. and J. N. Knull; 1, Phoenix, Sept. 14, 1937, 1, Nov. 10, 1938, Christensen; 2, Chiricahua Mts., Sept. 14, 1938, D. J. and J. N. Knull and 2, Roosevelt Dam, Oct. 26, 1930. (Texas) 11, Concan, July 6, 1936, D. R. Lindsay; 19, Concan, July 6, 1936, R. H. Beamer; 2, Val Verde Co., June 28, 1940, D. J. and J. N. Knull; 1, Uvalde Co., June 26, 1940, D. J. and J. N. Knull; 1, Ft. Stockton, May 31, 1937, D. J. and J. N. Knull; 1, Davis Mts., June 2, 1937, D. J. and J. N. Knull and 2, Medina Co., June 24, 1940, D. J. and J. N. Knull.

Host Plants: Ball writes (1932) "—a few nymphs and many adults were taken on the Water-Wally (*Baccharis glutinosa*) which grows so abundantly in the washes in Arizona." Other records on specimens examined were white clover and willow at Tucson, Arizona, and peach foliage and *Amaranthus* sp. in Bexar Co., Texas.

Comparative Notes: This species varies considerably in color—from almost black in southern California to light brown in southern Texas. In some few cases the face becomes reddish and it resembles *irroratus* somewhat, but the darkness of *irroratus* is due to dark dots—that of *loricatus* is a cloudiness. In Texas this species resembles *albifrons* but can be easily separated by the male genitalia.

One male cotype of *irroratus*, with a reddish face, collected at Tijuana, Mex., June 15, 1908, proved to be this species. Dr. Ball had already realized this and had so placed it in his collection. Osborn (1921) in listing *loricatus* from Florida was evidently referring to *albifrons*.

19. *Scaphytopius (Cloanthanus) pennatus* Hepner

Scaphytopius (Cloanthanus) pennatus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 90, 1946.

Resembles *loricatus* but slightly smaller, larger markings on crown and with wing-like processes at apex of aedeagus. Length: female 4 mm., male 3.8 mm.

Color: Crown dark brown to fuscous, except for light markings as follows: narrow line along anterior margin, wedge, two pairs of large spots forming an incomplete band before eyes, a pair of large spots at base next median suture and a smaller pair next eyes. Pronotum same color as crown with vittae usually distinct. Scutellum yellow to brown with typical light markings usually distinct. Face yellow with a few dark spots along lateral margins of genae and in area of sharksmouth; vitta behind eye sometimes faintly indicated. Forewing semihyaline fulvous with brown veins and irroration throughout, except for light aeroles.

Structural Characteristics: Crown about one and two-thirds as long as width between eyes, slightly convex on each side of a bluntly pointed apex. Pronotum less than three-fourths as long as crown, about three times as wide as length at middle. Clypeus about twice as long as width at ocelli, margins slightly concave near base of antennae. Face broadly convex in lateral view, except for slight concavity between anterior margin of eyes. Forewing with typical venation in clavus, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin rounded to a blunt point; anterior margin concave on each side of a broad, rounded median lobe. Plates relatively broad near base, apical portion short and slender. Aedeagus roughly "L"-shaped, shaft almost parallel margined to a pair of wing-like processes at apex; base almost as long as shaft. Styles about twice as long as greatest width, almost parallel margined to lobe on outer margin before finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex; posterior margin slightly produced to a broad, oval median lobe.

Types: Holotype ♂, allotype ♀, Brownsville, Texas, July 3, 1938, R. H. Beamer, in the Snow Entomological Collections. Paratypes as follows: (Texas) 1 ♂, Hidalgo Co., July 28, 1928, A. M. James; 1 pr., Cameron Co., Aug. 3, 1928, L. D. Beamer; 1 ♀, Cameron Co., Aug. 3, 1928, R. H. Beamer; 1 ♂, Brownsville, July 4, 1938, Jean Russell; 1 ♂, Brownsville, June 29, 1938, R. H. Beamer; 1 ♂, Brownsville, June 29, 1938, R. I. Sailer.

Host Plants: No host plant is known.

Comparative Notes: This species is apparently restricted to southern Texas. It is nearest *loricatus*, but has more distinct spots on crown and wing-like processes at apex of aedeagus.

20. *Scaphytopius (Cloanthanus) flavifrons* Hepner

Scaphytopius (Cloanthanus) flavifrons, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 91, 1946.

Resembling *pennatus* but broader and with longer apical processes at apex of aedeagus. Length: female 4 mm., male 3.8 mm.

Color: Crown dark brown with light marks as follows: wedge, two spots on each side of wedge along anterior margin, the one nearest eye smallest; a spot on each side of median suture on disc; a large spot on each side of median suture and a smaller one next each eye on posterior margin. Pronotum light brown with many fuscous dots throughout; typical light vittae indicated. Scutellum ivory to yellow with dark color restricted primarily to basal half. Face bright yellow, sometimes flecked on clypeus and outer margins of genae; much lighter than venter. Forewings translucent brown and white, the white primarily restricted to aeroles in the male; darkest on outer antepical cell and adjacent area of costa.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, margins convex on each side of rounded apex. Pronotum about three-fourths length of crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly sinuate at antennae. Clypellus broadest near apex. Face distinctly convex in lateral view. Forewing with ten to twelve recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of bluntly-pointed apex; anterior margin with long, slender, median lobe. Aedeagus roughly "L"-shaped, dorsal part broader but slightly shorter, shaft slightly curved near base, a pair of pointed apical processes, each about two-fifths length of shaft. Styles about two and one-half times basal width, distinct lobe on outer margin before outwardly projecting, finger-like, apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margins convex; posterior margin convex, slightly lobed at middle.

Types: Holotype ♂, Brownsville, Texas, May 25, 1939, D. J. and J. N. Knull, in the Knull collection, Ohio State University, Columbus, Ohio. Allotype ♀, Brownsville, Texas, Dec. 29, 1945, R. H. Beamer, in the Snow Entomological Collections. 1 ♀ para-type, Cameron Co., Texas, Aug. 3, 1938, R. H. Beamer.

Host Plants: No host plant is known.

Comparative Notes: This species is apparently restricted to the extreme southern part of Texas and is relatively rare. Its broadness and distinct genitalia separate it from any other species in the area.

21. *Scaphytopius (Cloanthanus) anisacanus* (Ball)

Nasutoideus anisacanus, Ball, E. D., Can. Ent., LXIII, p. 222, 1931.

Resembles *loricatus* but larger, with a different pattern on crown and with long aedeagus and small paraphyses. Length: female 4.5 mm., male 4.5 mm.

Color: Crown with area between eyes ivory with brown irrorations, irregular brown markings around wedge and usually dark lines connecting these two dark areas; this leaves a more or less complete light band before the eyes and the remainder of crown consisting primarily of alternating thin light and dark irregular lines. Pronotum milky with fuscous irrorations excepting typical light lines. Scutellum brown with typical light markings. Face creamy yellow with apex of clypellus black and sometimes light markings on clypeus and a few marks behind eye.

Structural Characteristics: Crown about one and two-thirds as long as width between eyes, slightly concave on disc, margins slightly convex to a bluntly-pointed apex. Pronotum almost three-fourths as long as crown, two and one-half times as wide as length at middle and about four and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slightly sinuate near base of antennae. Clypellus broadest near apex. Face almost straight in lateral view. Forewing with vein-like markings in brachial cell and about eleven recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin oval, with a small apical lobe; anterior margin somewhat concave on each side of median lobe. Paraphyses small and short, much shorter than shaft of aedeagus. Aedeagus about as long as plates, evenly narrowed to sharp curve near outer third; apical third almost parallel margined to a pair of small, slender apical processes. Styles over twice as long as greatest width, narrowest near middle, broadly rounded on outer margin to a short, outwardly projecting, apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex; posterior margin

lobed on each side and small lobes on each side of a small median notch.

Types: Holotype ♀, allotype ♂, Sabino Canyon, Ariz., June 28, 1930, E. D. Ball, in the National Museum, Washington, D. C., 1 pair of paratypes on hand—Santa Catalina Mts., Ariz., July 17, 1930, E. D. Ball.

Additional Material Studied: Babaquivari Mts., Ariz.

Host Plants: Ball (1932) writes "—types together with the nymphs were taken on the mint-like plant (*Anisacanthus thurberi*) near Tucson, Arizona."

Comparative Notes: This is a relatively large species, almost covered with vermiculations. The long, curved aedeagus with tiny paraphyses is distinct and unlike any other species.

22. *Scaphytopius* (*Cloanthanus*) *contractus* Hepner

Scaphytopius (*Cloanthanus*) *contractus*, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 92, 1946.

Resembles *loricatus*, but lighter in color, shorter crown and small paraphyses. Length: female 4.1 mm., male 3.8 mm.

Color: Crown white with an irregular, broad band across middle and a few thin lines on each side of wedge, yellow to brown. Pronotum a dark greenish-fulvous with light vittae distinct and sometimes irregularly bordered with dark dots. Scutellum same color as pronotum, or slightly lighter, with light markings distinct. Face yellow, narrow white line along margin between ocelli; slightly tawny behind eye, except for short, faint vitta; apex of clypellus black.

Structural Characteristics: Crown about one and two-thirds as long as width between eyes, lateral margins convex on each side of bluntly pointed apex. Pronotum only slightly shorter than crown, two and one-half times as wide as length at middle and five times as wide as length behind eyes. Clypeus about twice as long as width between ocelli and, except for slight sinuation at antennae, evenly narrowed to clypellus. Face convex in lateral view. Forewings with vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin oval; anterior margin concave on each side of a blunt, narrow, median lobe. Plates relatively slender, broadest on basal third. Small, short paraphyses, barely extending to apex of valve. Aedeagus

almost parallel-margined throughout, consisting of a basal, stem-like part, a short, simple, slightly curved shaft and an apical part about as long as basal part but curved at a right angle on middle. Styles somewhat over twice as long as basal width, "dog-legged" and almost parallel margined on middle, slightly lobed on outer margin at apical fourth before finger-like apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly concave, posterior margin produced at middle with a very shallow median notch.

Types: Holotype ♂, allotype ♀, and 1 ♀ paratype, Brownsville, Texas, June 29, 1938, R. H. Beamer, in the Snow Entomological Collections. 1 ♂ paratype, Brownsville, Texas, June 29, 1938, L. W. Hepner.

Host Plants: The host plant is not known.

Comparative Notes: This species, evidently restricted to southern Texas, is quite distinctive with its yellow face and short aedeagus with short, small genital paraphyses.

23. *Scaphytopius (Cloanthanus) brunneus* Hepner

Scaphytopius (Cloanthanus) brunneus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 93, 1946.

Resembles *loricatus* but lighter, darker on lateral margins of face and with small genital paraphyses. Length: female 4 mm., male 3.7 mm.

Color: Crown brown with light markings as follows: narrow line along anterior margin; wedge and a pair of oblique lines on each side; three pairs of markings on a band before eyes, the median pair longest; two pairs of spots on posterior margin, one next each eye and one on each side of median suture, the median pair often split anteriorly. Pronotum about same color as crown with typical vittae evident. Scutellum brown with typical light markings. Clypeus, lorae and clypellus yellow to fulvous with white sharksmouth; irregular area along margin between eyes and irregular light markings in area of sharksmouth, brown; apex of clypellus dark. Genae with numerous dark irrorations, vitta behind eye irregular but distinct. Forewing semihyaline fulvous with milky aeroles and brown irrorations; veins brown, becoming fuscous on apex and costa.

Structural Characteristics: Crown about one and one-third times as long as width between eyes, longer in female, anterior margin almost straight on each side of a blunt apex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as

crown, shorter in female, about two and one-half times as wide as length at middle and about four times as wide as length behind eyes. Clypeus over twice as long as width at ocelli, practically no constriction at antennae. Clypeus relatively slender and somewhat enlarged near apex. Face in lateral view almost straight in male, definitely concave between anterior margin of eyes in female. Forewing with several vein-like marks in brachial cell and eight or nine recurved veins to costa.

Genitalia: Valve somewhat shorter than greatest width; posterior margin convex on each side of a bluntly pointed apex; anterior margin with relatively long median lobe. Plates short and very broad near base. Aedeagus in lateral view, broad, roughly "U"-shaped, dorsal part shortest, shaft broad and short, enlarged at apex. Paraphyses very small and short, hardly reaching to apex of shaft of aedeagus. Styles about three times as long as basal width, relatively large lobe on outer margin just before slender, finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin convex, posterior margin with small lobe at each side and broad median lobe.

Types: Holotype ♂, allotype ♀ and a pair of paratypes, Paradise Key, Fla., April 9, 1921, D. M. DeLong, in the DeLong collection, Ohio State University, Columbus, Ohio. Additional paratypes as follows: 2 ♀ ♀, Key Largo, Fla., July 19, 1939, R. H. Beamer.

Host Plants: No host plant is known.

Comparative Notes: The only species with which this might be confused in southern Florida is *albifrons*, from which it may be separated by its marginal infuscation on face, and small paraphyses.

24. *Scaphytopius (Cloanthanus) fuscifrons* (Van Duzee)

Platymetopius fuscifrons, Van Duzee, Bull. Buffalo Soc. Nat. Hist., V, p. 206, 1894.

Platymetopius abruptus, Ball, E. D., Ent. News, XX, p. 165, 1909.

Resembling *frontalis*, but with shorter crown, face and crown entirely dark and with plates of male very short. Length: female 4.5 mm., male 4 mm.

Color: Crown fuscous and white mottled in male, lighter in female, usually darkest on each side of median suture. Pronotum same color as crown with irregular vittae usually evident. Scutellum dark, orange spot near each basal corner, typical light markings distinct. Face in male fuscous with small white spots through-

out, darkest on outer margin of genae, female usually lighter; sharksmouth small in both; white vitta behind eye and two shorter vittae before eye, distinct. Forewing of male fuscous with semihyaline milky spots throughout, larger in costal area; female lighter, usually semihyaline milky with brown veins, darkest in apical cells. Occasionally females are found which are the same color as the males but usually they are much lighter.

Structural Characteristics: Crown about one and one-third as long as distance between eyes, anterior margin slightly convex on each side of a blunt apex; wedge about one-third length of crown. Pronotum about four-fifths as long as crown, over twice as wide as length at middle and four times length behind eyes. Clypeus less than twice as long as width between ocelli, only slightly narrowed, if at all, at antennae. Clypellus enlarged at both ends. Face convex in lateral view, more so in the male. Forewing with venation typical, about six vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve over three-fourths as long as greatest width, broadly oval on posterior margin; anterior margin broadly produced on median third. Plates truncate, extending only slightly beyond styles. Paraphyses broad, extending well beyond plates, apices spear-like. Aedeagus about as long as width at base, evenly narrowed to a flange-like, broadly pointed apex. Styles over twice as long as basal width, slightly constricted on basal third, outer margin rounded to finger-like process on apical third.

Last ventral segment of female almost three times as wide as length at middle, lateral margins convex, posterior margin lobed on outer third, median third concave with relatively long, parallel-sided notch at middle.

Types: Lectotype ♂, "Arizona," in Iowa State College collection, Ames, Iowa, lectoallotype ♀, same data, here designated. Both of these were on hand for study.

Additional Material Studied: (California) San Jacinto Mts., Topango Canyon, Arroyo Seco River, Alpine, Eureka, Beaumont, Gibson and Pine Valley. (Arizona) Huachucua Mts., Oak Creek Canyon, Chiricahua Mts., Santa Rita Mts., Flagstaff, Glenn Oaks, Santa Catalina Mts. and Pinal Mts. (Utah) Alton and Logan Canyon. (Colorado) Rabbit Ears Pass. (Wyoming) Grand Teton National Park and Yellowstone Park.

Host Plants: Ball (1932) writes "—apparently strictly confined to the buckbrush. The writer has taken it commonly in Utah and

Arizona on *Ceanothus fedleri*." One specimen was taken in 1938 by R. H. Beamer on *Amorpha frutiosa* in Huachucua Mts., Arizona, but this may have been merely resting there.

Comparative Notes: This species, with its two subspecies, are distinctly different from other species in the shape of the external genitalia. References to this species from east of the Rockies probably refer to *nigrifrons* or *magdalensis*.

25. *Scaphytopius (Cloanthanus) fuscifrons compactus* (Ball)

Platymetopius compactus, Ball, E. D., Ent. News, XXVII, p. 176, 1916.

Resembles *fuscifrons* but with definite light band on crown before eyes. Length: female 4.7 mm., male 4.5 mm.

Color: Crown black with yellow irrorations except for irregular light band before eyes, wedge, and a spot on posterior margin next each eye; often a pair of oblique light marks on base about half way between median suture and eyes. Pronotum semihyaline milky with heavy black irrorations, heaviest near posterior margin, lightest on anterior and lateral margins, often yellow area behind each eye; vittae obscure or faintly indicated near lateral margins. Scutellum with basal half brown with ivory or yellow spots in each corner and irregular spots throughout; apical half usually ivory to yellow with few dark markings, if any. The scutellum varies considerably, but is usually much lighter than in *fuscifrons*. Forewing semihyaline white, with heavy black markings, especially on disc of outer anteapical and adjoining area of costa and in apical cells. The amount of black may vary from almost none in specimens from Colorado and Wyoming to almost entire in specimens from the mountains of California. Face chocolate brown to black, lightest on lorae, with small, light dots throughout; short light vitta behind eye, one below ocellus and another at base of antennae; sharksmouth short but distinct; basal margin of clypeus narrowly lined with light.

Structural Characteristics: Crown only slightly longer at middle than width between eyes; wedge about one-third length of crown. Pronotum about three-fourths as long as crown, almost three times as wide as length at middle and four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly sinuate near base of antennae. Clypellus widest near apex. Face convex in lateral view. Forewing venation often obscured by dark markings.

Genitalia: Valve about four-fifths as long as greatest width, posterior margin broadly rounded; anterior margin slightly concave on

each side of a slender median process. Plates short, evenly rounded on outer margins. Paraphyses more or less parallel-margined to spearlike apices. Aedeagus about as long as basal width, apex flange-like and bluntly pointed. Styles reaching almost to apex of plates, about two and one-half times as long as greatest width, sinuate near basal third, broadly lobed on outer margin to a finger-like process on apical third, somewhat more slender than in *fuscifrons*.

Last ventral segment of female almost three times as wide as greatest length, lateral margins convex, posterior margin with deep, "V"-shaped, median suture and a small concavity on each side.

Types: Lectotype ♀, Dunsmuir, Calif., Aug. 13, 1912, E. D. Ball, here designated, in the National Museum, Washington, D. C. Allotype ♂, Dunsmuir, Calif., June 29, 1935, R. H. Beamer, here designated, in the Snow Entomological Collections. Parallotype ♂♂ as follows: (California) 2, Towie, Aug. 20, 1938, R. I. Sailer; 6, Towie, Aug. 20, 1938, R. H. Beamer; 1, Echo, Aug. 10, 1940, R. H. Beamer and 1, Yosemite National Park, Aug. 1, 1940, R. H. Beamer. (Wyoming) 1, Grand Teton National Park, Aug. 18, 1931, John Nottingham. (Montana) 2, Haugan, Aug. 9, 1931, R. H. Beamer and 2, Haugan, Aug. 9, 1931, John Nottingham.

Host Plants: Ball says (1932) "—taken by the writer on a tall species of Buckthorn (*Ceanothus* sp.) in northern California and has since been taken in small numbers in the higher mountains of Arizona." However, Ball may have confused this subspecies with the following subspecies, which it resembles.

Comparative Notes: This subspecies evidently replaces *fuscifrons* at high altitudes.

26. *Scaphytopius (Cloanthanus) fuscifrons minutus* Hepner

Scaphytopius (Cloanthanus) fuscifrons subsp. *minutus*, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 94, 1946.

Resembles *compactus*, but smaller, with basal area of crown light and with distinct light band across forewing. Length: female 4 mm., male 4 mm.

Color: Crown brown except for ivory to yellow markings as follows: wedge, narrow area next pronotum, more or less distinct band before eyes, and narrow line along anterior margin. Pronotum brown irrorate with fulvous, more or less broad milky area along posterior margin; vittae indistinct or absent, except near lateral margins. Scutellum ivory to yellow, large brown spot near each basal corner and sometimes indistinct irrorations between these.

Face reddish-brown, approaching black on lateral margins of genae and near sharksmouth; small, light irrorations throughout, larger light spot along margin of genae next lower part of lorae, on disc of loral sclerites and on disc of clypeus near apex; a light vitta behind eye, a shorter one near ocellus and another near base of antennae; sharksmouth small but distinct; basal margin light. Forewing semihyaline milky with black markings on basal half and in anteapical and apical cells, leaving a distinct light band across second cross-vein and across apices of anteapical cells, giving a distinct two-banded appearance, more distinct in males, which are usually slightly darker; veins dark throughout.

Structural Characteristics: Crown about one and one-third as long as width between eyes, margins slightly convex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown, about three times as wide as length at middle and four and one-half times length behind eyes. Clypeus almost twice as long as distance between ocelli, only slightly sinuate, if any, at antennae. Clypellus widest near apex. Face convex in lateral view, although slightly concave between anterior margin of eyes. Forewing with claval veins joining or almost joining; eight or ten more or less distinct cross-veinlike marks in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve about four-fifths as long as greatest width, oval on median half of anterior margin, broadly truncate on median half of anterior margin. Plates short, bluntly pointed. Paraphyses only slightly broadened toward sharp apices. Aedeagus short, smallest at base, broadest just before blunt apex. Styles about two and one-half times as long as basal width, sinuate on basal fourth, slightly lobed on outer third to a parallel margined apical process.

Last ventral segment of female about three times as wide as greatest length; irregularly lobed on each side of a relatively long, parallel-margined median notch.

Types: Holotype ♂, allotype ♀, and 6 ♀ and 7 ♂ paratypes, Miami, Arizona, Aug. 6, 1941, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Arizona) 1 ♂, Yarnell Hts., Oct. 8, 1929, 1 ♀, July 21, 1929, E. D. Ball; 4 ♀ ♀, 2 ♂ ♂, Pinal Mts., July 7, 1936, E. D. Ball; 1 ♀, Santa Catalina Mts., July 30, 1930, E. D. Ball; 1 ♂, Santa Rita Mts., June 16, 1933, P. W. Oman and 1 pr., Douglas, June 10, 1936, E. D.

Ball. (Texas) 1 ♀, Concan, July 6, 1936, R. H. Beamer and 1 ♂, Chisos Mts., Sept. 19, 1938, D. J. and J. N. Knull.

Host Plants: Ball's reference (1932) to *compactus* in Arizona probably referred to this subspecies, as some of his specimens were labelled "*Ceonothus*."

Comparative Notes: The specimens from Texas are somewhat smaller than those from Arizona, but appear to be the same thing. It is easily separated from *compactus* by its smaller size and more light color on crown and face.

27. *Scaphytopius (Cloanthanus) dodonanus* (Ball)

Nasutoideus dodonanus, Ball, E. D., Can. Ent., LXIII, p. 225, 1931.

Resembling *fulvus* but with longer crown, with genital paraphyses united basally and western in distribution. Length: female 4.2 mm., male 4 mm.

Color: Crown fulvous to brown with ivory markings as follows: wedge, three pairs of spots across crown in front of eyes, a pair of spots near median suture at base and a pair of small spots on posterior margin next eyes. Pronotum yellow-fulvous, vittae usually at least faintly indicated. Scutellum yellow to orange with typical markings ivory. Face creamy-yellow throughout. Forewings semihyaline-fulvous with a few scattered aeroles; veins concolorous except in apical cells and costa, where they are brown.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, bluntly pointed, wedge only about one-fifth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and about five times length behind eyes. Clypeus about twice as long as width at ocelli, more or less evenly narrowed to apex. Clypellus widest near apex. Face convex in lateral view except near apex, where it is slightly concave. Forewing with several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about as long as greatest width, rounded on posterior margin, concave on each side of median lobe on anterior margin. Plates slender, over twice as long as greatest width, broadest on basal fourth. Paraphyses loosely joined on basal third, broadest on apical third, constricted on apical fifth and enlarged again before sharp apex. Aedeagus inserted where paraphyses separate, roughly an inverted "T"-shaped, with ventral process short and stout, dorsal process longer and more slender and shaft slightly nar-

rowing to a pair of erect processes at apex. Styles about three times as long as basal width, almost parallel-margined on basal three-fourths, except for slight constriction near middle, slightly lobed on outer margin before outwardly-projecting, finger-like, apical process.

Last ventral segment of female about twice as wide as length at middle, posterior margin straight and slightly narrower than at widest point.

Types: Holotype ♀, allotype ♂, Tucson, Arizona, June 28, 1930, E. D. Ball, in the National Museum, Washington, D. C. One pair of paratypes, Tucson, Arizona, Sept. 22, 1929, E. D. Ball, on hand for study.

Additional Material Studied: (Arizona) Sabino Canyon, Santa Catalina Mts., Santa Cruz River, Baboquivari Mts. and La Osa River.

Host Plants: Ball (1932) writes "Yellow nymphs and brownish yellow adults were taken exclusively on the shrub *Dodonaea viscosa* var. *angustifolia* in Arizona."

Comparative Notes: Some specimens are gray with darker veins and markings, especially in specimens collected in October and November. The male genitalia is unlike any other species examined.

28. *Scaphytopius (Cloanthanus) celtidus* (Ball)

Nasutoideus celtidus, Ball, E. D., Can. Ent. LXIII, p. 224, 1931.

Somewhat resembling *anisacanus* but smaller, lighter in color, with area of crown next pronotum with few or no markings and with distinctly different genitalia. Length: female 4.5, male 4 mm.

Color: Crown white except for indistinct fuscous band between anterior part of eyes, area around wedge, a few lines on disc and usually a few small spots on posterior margin next eye. Pronotum semihyaline milky with scattered brown to fuscous dots, darkest along anterior and near posterior margin. Scutellum white to yellow, except for indistinct darker markings near apex and sometimes near each basal corner. Face ivory with brown vermiculations throughout; sharksmouth and vitta behind eye, distinct. Forewing semihyaline milky with numerous scattered fuscous vermiculations, usually dark area on costa and adjoining anteapical cell opposite apex of clavus. In some dark specimens, the vermiculations are fused to form large dark blotches throughout wing.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, margins slightly convex on each side

of blunt apex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and about four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli in female, slightly shorter in male, slightly sinuate near antennae. Clypellus largest near base. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with venation typical with numerous markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve roughly triangular, posterior margin somewhat convex on each side of a bluntly pointed apex; anterior margin with broad median lobe. Plates short, broad near base. Paraphyses joined on basal three-fourths, apical fourth slightly bulbous before sharp apices. Aedeagus in lateral view with broad dorsal portion, shaft "J"-shaped, almost parallel-margined, and with a pair of slender apical processes about as long as shaft; in ventral view the apical processes extend laterally. Styles about two and one-half times as long as basal width, lobed on outer margin just before curved, outwardly projecting, finger-like apical processes.

Last ventral segment of female slightly more than half as long as greatest width, lateral margins slightly convex; posterior margin with small lobe near outer margin and a broad median lobe notched at middle.

Types: Holotype ♀, allotype ♂, Tucson, Arizona, July 24, 1920, E. D. Ball, in the National Museum, Washington, D. C. One pair of paratypes, Tucson, Arizona, June 28, 1930, E. D. Ball, were on hand for study.

Additional Material Studied: (Arizona) Lewis Spgs., Santa Rita Mts., Sabino Canyon.

Host Plants: Ball (1932) writes "—strictly confined, both nymphs and adults, to the evergreen desert hackberry (*Celtis pallida*)."

Comparative Notes: The distinctively marked crown and distinct male genitalia easily separate this species from any other.

29. *Scaphytopius (Cloanthanus) californiensis* Hepner

Scaphytopius (Cloanthanus) californiensis, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 95, 1946.

Resembles *irroratus* but lighter, larger, with larger spots on crown, and with short genital paraphyses. Length: female 4.2 mm., male 3.8 mm.

Color: Crown with fuscous areas around wedge and between

anterior parts of eyes, remainder fulvous except for following light markings: wedge, thin line along anterior margin, three pairs of spots before eyes, the median pair greatly elongated and joining a pair of spots on posterior margin next median suture. Pronotum milky semihyaline to fulvous with irrorations throughout, vittae usually indicated. Scutellum orange with typical light markings usually lined with fuscous. Face fulvous with brown irrorations throughout, usually slightly darker along lateral margins and lightest on lorae; sharksmouth and vitta behind eye usually fairly distinct. Forewing semihyaline milky to pale fulvous with veins and numerous dots, forming aeroles throughout; dark area on costa and adjoining anteapical cell.

Structural Characteristics: Crown of male about one and one-half times as long as width between eyes, slightly longer in female; margins slightly convex in male, almost straight in female. Pronotum about three-fourths as long as crown, almost two and one-half times as wide as length at middle. Clypeus slightly more than twice as long as width at ocelli, slightly sinuate near antennae. Clypellus relatively slender, widest near apex. Face in lateral view convex, slightly concave between anterior margin of eyes in female. Forewing with venation typical, about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin with a relatively long median lobe. Paraphyses joined on basal two-thirds, apices free and sharply pointed. Shaft of aedeagus short, curved, only slightly narrower at apex than at base. Styles only about twice as long as basal width, distinct lobe on outer margin just before outward-projecting, finger-like, apical process.

Last ventral segment of female slightly over half as long as greatest width, lateral margins slightly converging; posterior margin straight with exception of small, broad, median lobe.

Types: Holotype ♂, allotype ♀, and 21 ♀ and 10 ♂ paratypes, Ventura, California, July 20, 1933, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (California) 2 ♂ ♂, Anza, July 29, 1938, R. H. Beamer; 1 pair San Gabriel Canyon, July 2, 1935, R. H. Beamer; 1 ♀, Mint Canyon, July 6, 1933, R. H. Beamer; 1 ♂, Mint Canyon, June 7, 1935, P. W. Oman; 2 ♀ ♀, 1 ♂, Alpine, July 5, 1931, E. D. Ball; 1 ♀, Three Rivers, June 9, 1935, P. W. Oman; 1 ♀, Fresno, May 20, 1898; 3 ♀ ♀, Monterey, July 22, 1935, R. H. Beamer; 2 ♀ ♀, Nipomo, July 24, 1935, R. H. Beamer; 1 pair Lompoc, Aug. 9, 1938, R. H.

Beamer; 1 ♀, Lompoc, Aug. 9, 1938, R. I. Sailer; 3 ♀ ♀, 1 ♂, Beaumont, June 12, 1931, E. D. Ball; 1 ♀, 2 ♂ ♂, Ontario, Oct. 21, 1938, Christensen; 2 pairs, Hemet, Oct. 26, 1938, Christensen; 1 ♀, Topango Canyon, Aug. 5, 1938, L. W. Hepner; 3 ♀ ♀, 7 ♂ ♂, Topango Canyon, Aug. 5, 1938, R. H. Beamer; 1 ♀, Santa Ana Canyon, July 30, 1932, R. H. Beamer; 1 ♂, Los Angeles, Uhler; 8 ♀ ♀, 2 ♂ ♂, Claremont, July 29, 1935, R. H. Beamer; 1 ♂, Claremont, July 29, 1935, Jack Beamer; 1 ♀, Palm City, Aug. 7, 1935, R. H. Beamer; 1 ♂, Escondido, July 15, 1941, R. H. Beamer; 1 ♀, 2 ♂ ♂, La Jolla, July 13, 1941, R. H. Beamer; 4 ♀ ♀, 2 ♂ ♂, San Diego, Aug. 7, 1935, 2 ♀ ♀, July 24, 1941, R. H. Beamer; 9 ♀ ♀, 3 ♂ ♂, San Diego, July 5, 1931, E. D. Ball; 1 ♀, July 17, 1915, 1 ♀, Aug. 29, 1915, L. A. Titus; 1 ♂, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 1 ♀, Strawberry, Aug. 8, 1929, R. H. Beamer; 2 pairs, Long Beach, July 4, 1931, E. D. Ball and 1 ♀, Lindsay Hts., Dec. 19, 1938, E. A. McGregor.

Host Plants: Specimens were examined which had been collected on *Arctostaphaleae glauca* and *A. zacaensis*, but these plants may have been only a resting place for them.

Comparative Notes: This species is restricted to southern California, somewhat resembles *nogalinus*, but has a longer, sharper, darker crown and quite different genitalia.

30. *Scaphytopius (Cloanthanus) diabolus* (Van Duzee)

Platymetopius diabolus, Van Duzee, E. P., Proc. Calif. Acad. Sci., XIV, p. 413, 1925.

Resembles *frontalis*, but lighter colored, with longer crown, more distinct band before eyes and western in distribution. Length: female 4.5 mm., male 4 mm.

Color: Crown black with ivory or white markings as follows: thin line along anterior margin; wedge and oblique mark on each side; irregular, almost complete band before eyes; and irregular markings in an area along basal margin, largest in female. Pronotum gray with irregular black irrorations, much lighter on lateral and anterior margins. Scutellum black with typical light markings. Clypeus light brown on apical two-thirds, darker on base in area of small sharksmouth. Lorae and clypellus light brown except for black tip of clypellus. Genae mottled brown to fuscous with white vitta behind eye and shorter one near ocellus, distinct. Forewing semi-hyaline white with irregular black markings throughout, heaviest on costa and in anteapical cell opposite apex of clavus.

Structural Characteristics: Crown about one and one-third times as long as width between eyes, anterior margin slightly convex on each side of a bluntly pointed apex; wedge very short. Pronotum slightly over two and one-half times as wide as length at middle and four times length behind eye. Clypeus about twice as long as width at ocelli, only slightly sinuate, if at all, at antennae; depression on each side at end of sharksmouth. Clypellus rather slender and slightly enlarged near apex. Face in lateral view straight in male, slightly concave between anterior margin of eyes in female. Forewing with outer claval vein approaching or touching second claval vein at cross-vein, often extra cross-veins in clavus; brachial cell with many vein-like marks and costal area with ten or eleven recurved veins.

Genitalia: Valve about one and one-third as wide as length at middle, posterior margin somewhat convex on each side of pointed apex; anterior margin with short, broad median lobe. Paraphyses broad, extending well beyond plates, almost parallel-margined to sharp apex. Aedeagus in ventral view short, apices sagittate. Styles long, about three times as long as basal width, constricted on basal fourth, outer margin rounded just beyond middle to a long, bluntly pointed, apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, evenly rounded on latero-posterior margin to a distinct median notch on posterior margin.

Types: Holotype ♂, No. 1788, allotype ♀, No. 1789, Mt. Diablo, Calif., July 14, 1916, E. P. Van Duzee, in the Museum of the California Academy of Science, San Francisco, Calif.

Material Studied: (California) Mt. Shasta, Yosemite Valley, Weed, La Jolla, Lone Pine, Mariposa, Colfax, Doyle, Beaumont, Chilcoot and Ontario. (Oregon) Grants Pass, Spray, Medford and Ashland. (Washington) Satus Pass and Toppinish. (Arizona) Grand Canyon, Jerome, Prescott and Granite Dell. (Nevada) "Nev." March, 1936. (Utah) Provo, Logan Canyon and Heber City. (Idaho) Ruhl. (Colorado) Macedonia and Poudre River Canyon.

Host Plants: Ball (1932) writes of *nasutus*, evidently referring to *diabolus*, "—taken in abundance, nymphs and adults, on the cliff rose (*Cowania stansburiana*) in Utah and Arizona."

Comparative Notes: The male of *nasutus* was probably this species, but since it was described in a paper on Jamaica insects, the

female from that island is designated holotype for that species, leaving *diabolus*, described from California, to include the specimens originally placed in *nasutus*. The color of forewing varies from white with scattered black vermiculations, to almost entirely black.

31. *Scaphytopius* (*Cloanthanus*) *pallidiscutus* Hepner

Scaphytopius (*Cloanthanus*) *pallidiscutus*, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 96, 1936.

Resembles *diabolus* but larger, with a longer crown, scutellum lighter colored, and with longer aedeagus. Length: female 4.5 mm., male 4.5 mm.

Color: Crown black with white marks as follows: a thin line along anterior margin; wedge and a line on each side parallel to margin; an almost complete, broad irregular band before eyes; and two pairs of spots along posterior margin, one pair next eyes and another next median suture, basal fifth with black replaced by fulvous or brown except for a few lines. Pronotum gray with scattered dark spots; irregular light vittae usually faintly indicated. Scutellum light fulvous to brown with typical light markings; sometimes almost entirely ivory. Face evenly reddish-brown, mottled throughout, much more unicolorous than *diabolus*, except for fuscous tip of clypellus, irregular black markings below small sharkmouth, light vitta behind eye and shorter one near ocellus.

Structural Characteristics: Crown about one and two-thirds as long as width between eyes, almost straight margined on each side of a bluntly pointed apex; wedge about one-fifth length of crown. Pronotum about two-thirds as long as crown, about two and one-half times as wide as length at middle, and four and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slightly sinuate at antennae; a depression, almost parallel to basal margin, on each side before eye. Clypellus broadest just before apex. Face in lateral view concave between anterior margin of eyes. Forewing with two or three cross-veins connecting claval veins; usually ten or more marks or cross-veins in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about four-fifths as long as greatest width, posterior margin convex on each side of a bluntly pointed apex; anterior margin evenly rounded. Paraphysis almost twice as long as style, largest near base, almost parallel-margined to sharp apex, except for constriction near outer third. Shaft of aedeagus slender,

about one-half as long as styles, evenly narrowed to a pair of short, dorsal, apical processes. Styles almost four and one-half times as long as greatest width, slightly constricted on basal third, distinct lobe on outer margin before long, slender process on apical half.

Last ventral segment of female somewhat less than twice as wide as length at middle, slightly concave on lateral margins, then rounded to a small median notch at middle on posterior margin; more truncate than *diabolus*.

Types: Holotype ♂, allotype ♀, and 12 ♀ and 8 ♂ paratypes, Boulevard, California, July 26, 1938, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes from California as follows: 1 ♂, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 3 ♀ ♀, Santa Cruz Mts., Aug. 13, 1938, R. I. Sailer; 1 ♀, Jamesburg, Aug. 11, 1938, R. H. Beamer; 1 ♀, Lockwood, July 24, 1935, R. H. Beamer; 1 ♀, Lompoc, Aug. 9, 1938, R. I. Sailer; 1 ♀, 2 ♂ ♂, Beaumont, June 12, 1931, E. D. Ball; 1 ♂, Big Bear Lake, July 26, 1932, R. H. Beamer; 2 ♀ ♀, 1 ♂, Topango Canyon, Aug. 5, 1938, R. I. Sailer; 1 ♀, Topango Canyon, Aug. 5, 1938, L. W. Hepner; 1 ♀, Claremont, July 29, 1935, R. H. Beamer; 12 ♀ ♀, 13 ♂ ♂, Pine Flats Camp, Indio, July 12, 1941, R. H. Beamer; 1 ♀, Jacumba, July 17, 1940, R. H. Beamer; 7 ♀ ♀, 3 ♂ ♂, Campo, Aug. 10, 1935, R. H. Beamer and 3 ♀ ♀, Pine Valley, July 27, 1938, 1 ♀, July 18, 1941, R. H. Beamer.

Host Plants: Specimens have been collected in southern California from *Ceanothus greggii purplexans* and *C. cuneatus* and *Arctostaphylae pungens* and *A. glauca*, so it is possible that *Ceanothus* or *Arctostaphylae* is the host of this species.

Comparative Notes: This species is similar to *diabolus*, but can be separated easily by the lighter scutellum, lighter and more evenly colored face and the longer aedeagus of the male. The female last ventral segment of this species is more truncate than that of *diabolus*. This species is evidently restricted to California.

32. *Scaphytopius (Cloanthanus) fulvus* (Osborn)

Platymetopius fulvus, Osborn, Herbert, Rep't. of New York St. Entomologist (20th Report) p. 519, 1905.

Resembles *magdalensis*, but fulvous throughout and with parapses bifid. Length: female 5 mm., male 4.5 mm.

Color: Crown fulvous with lighter markings as follows: wedge; one or two pairs of dots between wedge and eye, a long mark on each side of median suture from near wedge to posterior margin and

another pair on posterior margin next eyes. Pronotum fulvous with light vittae sometimes faintly indicated. Scutellum fulvous with typical light markings. Face fulvous, usually lightest on clypeus, with relatively long sharksmouth faintly indicated. Forewing fulvous, veins only slightly darkened except near apex and on costa.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, anterior margin only slightly convex on each side of pointed apex; wedge about one-fourth length of crown. Pronotum somewhat shorter than crown, a little less than two and one-half times as wide as length at middle and about four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, almost evenly narrowed to apex. Clypellus relatively narrow and enlarged near apex. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with typical venation, seven or eight recurved veins to costa.

Genitalia: Valve almost as long as greatest width; posterior margin only slightly convex on each side of a sharp apex, anterior margin with broad, short median lobe. Paraphyses narrow, about twice as long as styles, with slender lateral process on outer third. Aedeagus roughly "U"-shaped, dorsal part lighter and less heavily sclerotized, shaft almost parallel-margined to a very small dorsal process at apex. Styles about four times as long as greatest width, almost parallel-margined on basal three-fourths, only slightly lobed on outer margin to finger-like apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margin rounded to a small median lobe.

Types: Lectotype ♂, lectoallotype ♀, Cold Spr. Harbor, New York, August 18, 1904, H. Osborn, here designated, in Osborn Collection, Ohio State University, Columbus, Ohio. The original description gives Oyster Bay as the type locality, but Cold Spring Harbor is within Oyster Bay and in this case, these two localities are identical. One cotype was on hand for study.

Additional Material Studied: (Wisconsin) Grand Rapids. (Connecticut) New Haven. (Maryland) Ashton. (Virginia) Cape Henry (North Carolina) Walnut and Franklin.

Host Plants: Osborn (1904) writes "—beaten from pine and huckleberry—As all are adults it is impossible to determine the food plant with certainty though it seems likely that it is the huckle-

berry and that individuals taken from pines were resting accidentally on the trees." Ball (1932) writes "—found yellow nymphs swarming on Bayberry (*Myrica carolinensis*) at Woods Hole, Massachusetts, July 7, 1925, a few days later an immature adult that was determined as *fulvus* was taken from this spot."

Comparative Notes: This species, with its subspecies *collaris*, has genitalia which differ considerably from any other—the long, slender bifid paraphyses and the long, slender shaft of the aedeagus easily separate it from any other species. It has a relatively wide distribution, but from the small number of specimens, it seems to be relatively uncommon.

33. *Scaphytopius (Cloanthanus) fulvus collaris* (Sand. and DeLong)

Platymetopius collaris, Ann. Ent. Soc. Amer., XII, p. 232, 1919.

Resembles *fulvus*, but with most of pronotum and basal half of scutellum dark brown and remainder of dorsum ivory to light fulvous. Length: female 5.3 mm., male 4.8 mm.

Color: Crown ivory to light fulvous; wedge and arcuate markings on disc often indicated. Pronotum brown, except for yellow to fulvous area on each lateral margin, slender median vitta, and dots throughout. Scutellum with basal half dark brown and apical half yellow to fulvous. Face completely yellow to fulvous and without irrorations. Forewings translucent pale fulvous, veins brown on apex and costal area.

Structural Characteristics: Crown about one and one-third as long as width between eyes, anterior margin straight to slightly convex on each side of bluntly pointed apex. Pronotum about as long as crown, two and one-half times as wide as length at middle and four times length behind eyes. Clypeus about twice as long as width at ocelli, slightly sinuate at antennae. Clypellus long and somewhat enlarged near apex. Face in lateral view almost straight in male, slightly concave between anterior margin of eyes in female. Forewing with typical venation; ten recurved veins to costa.

Genitalia: Male and female genitalia about the same as for *fulvus*.

Types: Holotype ♂, allotype ♀, Penfield, Clearfield Co., Pennsylvania, Aug. 24, 1918, Sanders, here designated, in the DeLong Collection, Ohio State University, Columbus, Ohio. The holotype was on hand for study.

Host Plants: The original description gives *Vaccinium* sp. as the plant from which the type material was taken.

Comparative Notes: This is apparently a rather rare species, as only the type specimen named above has been seen by the author. Except for color, it agrees with *fulvus* in almost every respect.

34. *Scaphytopius (Cloanthanus) frontalis* (Van Duzee)

Platymetopius frontalis, Van Duzee, E. P., Can. Ent., XXII, p. 112, 1890.

Resembles *loricatus*, but with lateral margins of face dark and with paraphyses. Length: female 4.1 mm., male 3.8 mm.

Color: Crown fuscous to black with light markings as follows: narrow line along anterior margin; wedge; a large irregular spot on margin before each eye and a smaller pair between these; two pairs of dots on posterior margin, one pair next eyes and another near median suture. The light spots are usually smaller on the male. Pronotum and scutellum about same color as crown with typical light markings. Clypeus yellow with brown markings near base, forming large sharksmouth and other irregular markings along basal margin. Clypellus and lorae yellow. Genae yellow mesially, infuscated behind eyes and along lateral margins, except for distinct white vitta behind eye; less distinct, short vitta near ocellus. Forewing semihyaline black, pale fulvous along veins; milky aeroles throughout.

Structural Characteristics: Crown about one and one-half times as long as width between ocelli, anterior margin slightly convex on each side of blunt apex; wedge about one-fourth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and four times length behind eye. Clypeus about twice as long as width at ocelli, margins almost straight. Clypellus relatively slender, slightly broadened near base. Face in lateral view almost straight. Forewing with typical venation, several vein-like marks in brachial cell and nine or ten recurved veins to costa.

Genitalia: Valve roughly triangular, almost as long as greatest width, posterior margin convex on each side of a pointed apex; anterior margin with a wide, short, median lobe. Paraphysis long, slender, almost parallel-margined to a sharp apex. Shaft of aedeagus "L"-shaped, curved on basal two-fifths, almost parallel-margined to blunt apex. Styles about four times as long as basal width, large lobe on outer margin just before relatively long, slender, finger-like, apical process.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin roughly circular with a small median notch.

Types: Lectotype ♂, Buffalo, N. Y., June, 1887, E. P. Van Duzee. Lectoallotype, same data, here designated. Both types on hand for study and located in Iowa State College Museum, Ames, Iowa.

Additional Material Studied: This species is one of the most common of the genus and occurs throughout the United States from Utah eastward and possibly into Mexico, as specimens are on hand from Brownsville, Texas. Hundreds of specimens are on hand from all parts of this area.

Host Plants: Many host plants are recorded for this species. Specimens were examined collected from hemp in Missouri and *Heterotheca subaxillaris* in Texas. Ball (1932) writes "—was taken in numbers on pure stands of wild blackberry, (*Rubus* sp.) in New Jersey, the District of Columbia and again at Gainesville, Florida." Osborn (1915) writes "ordinarily occurs in grass-land and is very frequently taken in adult form from oak trees." Fletcher (1930) gives native grassland as the host plant in Texas. Gibson and Cogan (1915) give clover, alfalfa, grasses and woody shrubs as the hosts in Missouri. Van Duzee (1894) gives oak bushes as the host plant at Buffalo, N. Y.

Comparative Notes: This species is the only blackish species with a short crown and yellow clypeus. Specimens from southern Texas and Florida are smaller than those collected farther north, but are identical in other respects.

35. *Scaphytopius (Cloanthanus) cinnamoneus* (Osborn)

Platymetopius magdalensis var. *cinnamoneus*, Osborn, Herbert, Bull. Maine Agri. Exp. Sta., No. 238, p. 114, 1915.

Resembles *magdalensis* but with indistinct markings on crown, lighter face and with more slender paraphyses. Length: female 5 mm., male 4.5 mm.

Color: Crown fulvous mottled with light, with white markings as follows: thin line along anterior margin; wedge; and two spots along posterior margin, one next each eye and one on each side of median suture. Pronotum fulvous, irregularly marked with brown, pale vittae usually faintly evident. Scutellum fulvous to light brown with typical light markings. Face bright fulvous, slightly clouded along lateral margins, sharksmouth and vitta behind eye faintly indicated. Forewing semihyaline light fulvous, with numerous

brown irrorations, becoming fuscous on apex and outer anteapical cell; veins brown, darker on costa.

Structural Characteristics: Crown almost one and one-half times as long as width between eyes, anterior margin only slightly convex on each side of bluntly pointed apex; wedge over one-third length of crown. Pronotum about three-fourths as long as crown, two and one-fourth times as wide as length at middle and three and one-half times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, somewhat constricted at antennae, slight concavity along sharksmouth. Clypellus relatively stout and enlarged near apex. Face in lateral view almost straight. Forewing with vein-like marks in brachial cell and about nine recurved veins to costa.

Genitalia: Valve about one and one-third as wide as length at middle, posterior margin bell-shaped to small, teat-like, rounded process at apex. Paraphysis with large basal, bulb-like process, almost parallel-margined to sharp apex. Aedeagus "L"-shaped, narrowest near slightly enlarged apex. Styles about four times as long as basal width, slightly sinuate near basal third, lobe on outer margin before stout, finger-like process on apical two-fifths.

Last ventral segment of female slightly less than twice as wide as length at middle, lateral margins slightly convex; posterior margin almost straight with small median notch.

Types: Lectotype ♂, Aug. 30, 1913, lectoallotype ♀, Aug. 5, 1913, Orono, Maine, Herbert Osborn, here designated, in the Snow Entomological Collections, were on hand for study.

Additional Material Studied: (Manitoba) Red Deer River, Mafeking, Birch River and Swan River. (Michigan) Thompson, Cheboygan Co., Bryants Bog and Mud Lake. (Minnesota) Eveleth and Itasca Park. (Wisconsin) Brule.

Host Plants: A long series was collected on *Chamaedaphne* at Itasca Park, Minnesota, by R. H. Beamer, and a pair was taken from the same host at Bryants Bog, Michigan, by H. B. Hungerford. "Bear berry" was given as the host of a long series collected at Mafeking, Manitoba, by R. H. Beamer. Both of these plants are in the heath family, so it is possible that the species is restricted to the family or certain plants in the family.

Comparative Notes: Although described as a variety of *magdalenensis*, the genitalia show this species to be more closely allied to *frontalis* than to any other. Several male specimens collected at

Toronto, Canada, in September are much darker and may represent the fall brood of this species.

36. *Scaphytopius (Cloanthanus) deltensis* Hepner

Scaphytopius (Cloanthanus) deltensis, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, 'p. 97, 1936.

Resembling *fuscifrons*, but with pointed plates in male and last ventral segment of female produced at middle. Length: female 4.8 mm., male 4.4 mm.

Color: Crown irregularly mottled fuscous and ivory, lightest along anterior margin. Pronotum about same color as crown, vittae evident only on lateral margins. Scutellum dark brown, with typical white markings and usually a large orange area near each basal corner. Face fuscous and light mottled; vitta behind eye, shorter ones near ocelli and antennae and long sharksmouth, light. Forewings semihyaline white, fuscous vermiculations throughout, darkest on apical cells, darkest in males; veins fuscous, becoming black on costa.

Structural Characteristics: Crown only slightly longer at middle than next eyes; about as long as width between eyes, anterior margin convex on each side of a very bluntly pointed apex; wedge about one-third length of crown. Pronotum somewhat longer than crown, about two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus somewhat less than twice as long as width at ocelli, only slightly constricted at antennae. Clypellus relatively stout, slightly enlarged near apex. Face in lateral view strongly convex. Forewing with several vein-like marks in brachial cell, about twelve recurved veins to costa and sometimes extra cross-veins in clavus.

Genitalia: Valve somewhat shorter than greatest width, posterior margin almost straight on each side of a rounded apex; anterior margin with broad, short median lobe. Paraphysis bulbed at base, slender and completely spiraled on middle, enlarged before sharp apex. Aedeagus curved near base, gradually narrowing to blunt apex, with small teeth on dorsal margin. Styles about three times as long as width at base, somewhat sinuate near middle, distinct lobe on outer margin just before finger-like, apical process.

Last ventral segment of female about as long as greatest width, lateral margins straight and converging; posterior margin convex except for small median notch.

Types: Holotype ♂, allotype ♀, 7 ♀ and 1 ♂ paratypes, Delta, California, June 28, 1935, P. W. Oman, in the National Museum, Washington, D. C. Additional paratypes as follows: 1 ♀, Mt. Shasta, June 29, 1935, P. W. Oman; 8 ♀ ♀, Delta, June 28, 1935, R. H. Beamer.

Host Plants: The host plant is not known.

Comparative Notes: This species superficially resembles *fuscifrons*, but can be separated easily by the external genitalia.

37. *Scaphytopius (Cloanthanus) dorsalis* (Ball)

Platymetopius frontalis var. *dorsalis*, Ball, E. D., Ent. News, XX: p. 164, 1909.

Platymetopius bicolor, DeLong, D. M., Ohio Jour. Sci., XVII: p. 38, 1916.

Resembling *frontalis* but with crown light and without markings and without white aeroles in forewing. Length: female 4.8 mm., male 4.5 mm.

Color: Crown ivory to yellow without markings. Pronotum dark brown, fading to yellowish along anterior and lateral margins; vittae very faintly indicated in male, mottled ivory with large, dark brown spot near each basal corner in female. Face fulvous, slightly darker behind eyes. Forewing opaque dark chocolate brown with yellow apex in male, veins light brown; apex of clavus and apex of corium semihyaline, darkest on outer anteapical cell in female.

Structural Characteristics: Crown about one and one-third as long as width between eyes, anterior margin slightly convex on each side of pointed apex. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and about four times length behind eyes. Clypeus about twice as long as width at ocelli, slight concavity inside each eye, only slightly constricted, if at all, at antennae. Clypellus relatively long, evenly and slightly enlarged from near base to near apex. Face in lateral view almost straight. Forewing with typical venation, several vein-like marks in brachial cell and six or seven recurved veins to costa.

Genitalia: Valve almost as long as basal width, posterior margin concave on each side of a bluntly pointed apex; anterior margin with median lobe. Paraphysis with basal bulb, slender to outer third, with distinct lateral process before enlarged, sharply pointed apex. Aedeagus curved near middle, broadest on basal half. Styles slightly over three times as long as basal width, sinuate near middle, small lobe on outer margin before long finger-like apical process.

Last ventral segment of female about five-eighths as long as

greatest width, latero-posterior margin broadly angled near middle on each side of a small median notch at apex.

Types: This species was described from two female types from Onaga, Kansas. Lectotype female, Onaga, Kansas, June 27, here designated, in the National Museum, Washington, D. C. Allotype male, Saratoga, Union Co., July 17, 1877, Uhler, here designated, in the Snow Entomological Collections. The holotype of *bicolor* was on hand for study, as well as the designated allotype of *dorsalis*.

Additional Material Studied: 1 ♀ with no collection data.

Host Plants: The host plant is not known.

Comparative Notes: This species is probably more closely related to *scriptus* than to any other species, but appears to be distinct. It evidently is quite rare, as the two female types, the pair studied, and the male type of *bicolor* are the only ones recorded.

38. *Scaphytopius (Cloanthanus) nigrifrons* (DeLong)

Platymetopius nigrifrons, DeLong, D. M., Conn. State Geological and Nat'l. Hist. Surv. Bull. 34, p. 103, 1923.

Resembling *frontalis*, but darker, with dark clypeus and with genital paraphyses enlarged near apex. Length: female 4.6 mm., male 4 mm.

Color: Crown black in male, fuscous in female, with light markings as follows: thin line along anterior margin; wedge and long, irregular, oblique mark on each side (in female these oblique marks may be broken into two more or less circular areas); two pairs of dots on posterior margin, one next each eye and one on each side of median suture (in the female, there is usually two dots on each side of median suture). Pronotum black with fulvous irrorations, male darkest; vittae evident. Scutellum fuscous to black with light markings at least indicated, female lighter. Face fuscous to black with light dots, and light markings as follows: vitta along posterior margin between eyes, long sharksmouth, faint vitta behind eye and shorter ones in front of eye near ocelli and antennae; face darkest on margins of genae and apex of clypellus. Forewings opaque black and fulvous, darkest in male, a few white aeroles on apical third.

Structural Characteristics: Crown about one and one-third as long as width between eyes, anterior margin convex on each side of bluntly pointed apex; wedge about one-third length of crown. Pronotum about as long as crown, two and one-half times as wide as

length at middle and about four times as wide as length behind eyes. Clypeus about twice as long as width at ocelli, definitely constricted at antennae. Clypellus stout, enlarged near apex. Face in lateral view convex. Forewing with irregular marks in brachial cell, seven or eight recurved veins to costa and often extra veins in clavus.

Genitalia: Valve about three-fourths as long as wide; posterior margin bell-shaped with a teat-like apical process; anterior margin with broad median lobe. Paraphyses enlarged on apical two-fifths with a sharp, lateral lobe near beginning of enlargement. Aedeagus in lateral view curved, narrowest near apex, and with small spines along dorsal margin. Styles about four times as long as basal width, sinuate near middle, lobe on outer margin before finger-like process on apical fourth.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margin rounded.

Types: Holotype ♂, North Branford, Conn., July 12, 1921, B. H. Walden, in the DeLong Collection, Ohio State University, Columbus, Ohio.

Additional Material Studied: (Connecticut) New Haven. (Maryland) Plummers Island. (Ohio) Hocking Co.

Comparative Notes: This black species, without light aeroles in wing, is quite distinctive, darker than *frontalis*, and with a black face; somewhat like *scriptus*, but darker.

39. *Scaphytopius (Cloanthanus) amplinotus* Hepner

Scaphytopius (Cloanthanus) amplinotus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 98, 1946.

Resembles *verecundus*, but larger, with large white spots throughout, and with lateral projection near apex of genital paraphysis. Length: female 4.6 mm., male 4 mm.

Color: Crown orange-fulvous with white markings as follows: thin line on anterior margin; wedge and oblique line on each side; three pairs of spots across crown before eyes, the median pair about size of wedge; on posterior margin a large spot at middle and a smaller spot next each eye. Pronotum same color as crown with irregular white vittae distinct and sometimes quite broad. Scutellum same color as crown, with typical markings and irregular markings, especially on disc, white. Genae and clypeus fulvous to yellow; area next lorae, vitta behind eye and shorter ones near antennae and ocelli, white. Forewing semihyaline orange-fulvous with large white areas throughout; veins dark on apical half and on costa.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin almost straight to pointed apex. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and three and one-half times length behind eye. Clypeus over twice as long as width at ocelli, slender, only slightly constricted, if at all, at antennae. Clypellus slender and slightly enlarged near apex. Forewing usually with claval veins nearest each other at cross vein, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin convex on each side of pointed apex; anterior margin broadly rounded. Paraphyses slender on basal four-fifths, enlarged, with a short lateral process just before sharply pointed apices. Shaft of aedeagus in ventral view almost parallel-margined, in lateral view, long, slender, slightly curved and without processes. Styles slightly over three times as long as basal width, sinuate just beyond basal third, slightly enlarged on outer margin just before finger-like, apical process.

Last ventral segment of female with latero-posterior margin broadly rounded and with a short, broad median lobe.

Types: Holotype ♂, allotype ♀, and 3 ♀ and 26 ♂ paratypes, Hudson, Florida, July 13, 1939, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Florida) 2 ♀ ♀, 1 ♂, Hudson, July 13, 1939, P. B. Lawson; 13 ♀ ♀, 19 ♂ ♂, Hudson, July 13, 1939, P. W. Oman; 2 ♀ ♀, Likely, July 24, 1934, R. H. Beamer; 1 ♀, 2 ♂ ♂, Lacoochee, Aug. 18, 1930, R. H. Beamer; 1 ♂, Eustis, Oct. 12, 1932, J. O. Pepper; 1 ♂, Old Town, July 11, 1939, P. B. Lawson and 1 ♂, Sanford, July 12, 1928, E. D. Ball. (Georgia) 1 pair, Okefenokee Swamp, July 25, 1939, 7 ♀ ♀, 1 ♂, July 27, 1939, and 2 ♀ ♀, 6 ♂ ♂, Aug. 3, 1934, R. H. Beamer.

Host Plants: The host plant is not known.

Comparative Notes: This species is the only one in this country with large white, unmarginated spots covering the entire dorsum.

40. *Scaphytopius (Cloanthanus) osborni* (Van Duzee)

Platymetopus osborni, Van Duzee, E. P., Ann. Ent. Soc. Amer., VII: p. 229, 1910.

Resembles *fuscifrons* but without blunt plates of male and with a different pattern on crown. Length: female 4.5 mm., male 4.3 mm.

Color: Crown brown with light markings as follows: short wedge; two large dots on each side between wedge and eye, sometimes united, a pair of short dashes behind wedge and two pairs of dots along posterior margin, one next each eye and one on each side of median suture. Pronotum gray and fulvous with brown to fuscous irrorations; vittae evident. Scutellum fulvous with typical light markings. Face ivory with brown to fuscous coarse irrorations, large irregular white blotches in lorae and clypellus and on adjoining area of genae; vitta behind eye and shorter ones near ocelli and antenna, distinct. Forewings semihyaline fulvous with dark irrorations and large milky aeroles throughout.

Structural Characteristics: Crown only slightly longer than width between eyes, only slightly longer at center than next eyes; apex rounded; wedge about one-fourth length of crown. Pronotum slightly longer than crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, relatively broad, constricted at antennae. Clypellus considerably enlarged near apex. Face in lateral view definitely convex. Forewing with venation typical, several vein-like markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin roughly bell-shaped with a small, rounded tip; anterior margin with short, broad median lobe. Paraphyses slender on basal half, gradually broadened to a sharp point on outer third before sharply pointed apices. Aedeagus small, parallel-margined and semicircular. Styles more than three times as long as basal width, slightly sinuate near middle, small lobe on outer margin before finger-like process on apical fourth.

Last ventral segment of female about twice as wide as length at middle, latero-posterior margin with small lobe on each side of median lobe with small median notch.

Types: Holotype ♂, allotype ♀, Los Amates, Guatamala, Jan. 17, 1905, and Feb. 28, 1905, J. S. Hine, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio.

Material Studied: (Texas) 1 ♂, Marfa, Aug. 7, 1936, E. D. Ball. (Mexico) Tamazunchale and Jacala.

Host Plants: The host plant is not known.

Comparative Notes: The one male from Marfa, Texas, is the only record of this species collected in the United States. Since it

was collected during the same month that Dr. Ball collected in Mexico, it is possible that the specimen was mislabeled, in which case it does not occur in this country.

41. *Scaphytopius (Cloanthanus) andromus* (Ball)

Nasutoideus andomus, Ball, E. D., Can. Ent., LXIII, p. 221, 1931.

Resembling *magdalensis*, but smaller, and with process on parapsysis near apex. Length: female 4 mm., male 3.6 mm.

Color: Crown fulvous with white marks as follows: line along anterior margin; wedge and indistinct oblique line on each side; a pair of relatively large spots on disc before eyes and a pair of longer marks between these; on posterior margin, a spot at center and next each eye. Pronotum about same color as crown, dark irrorations, especially in male, light vittae usually evident, although often indistinct. Scutellum fulvous with typical light markings, usually some fuscous markings in male. Face fulvous, mottled with light, white markings as follows: long sharksmouth, vitta behind eye and shorter ones near ocellus and antennae. Apex of clypellus only slightly darkened, if at all. Face in lateral view slightly concave between anterior margin of eyes. Forewing semihyaline fulvous with small milky aeroles throughout.

Structural Characteristics: Crown a little more than one and one-half times as long as width between eyes, anterior margin slightly convex on each side of bluntly pointed apex; wedge over one-fourth length of crown. Pronotum about three-fourths as long as crown, about two and one-half times as wide as length at middle and four times length behind eyes. Clypeus about twice as long as width at ocelli, very slightly sinuate near antennae. Clypellus relatively slender, enlarged near apex. Forewing often with extra cross-veins in clavus, several vein-like marks in brachial cell and about nine recurved veins to costa.

Genitalia: Valve a little wider than length at middle, posterior margin convex on each side of very bluntly pointed apex; anterior margin with broad, rounded lobe on median half. Paraphyses longer than plates, coiled near base, small lateral process on outer third before enlargement near sharply pointed apices. Aedeagus in lateral view almost straight, small teeth on dorsal margin on apical half. Styles about three times as long as basal width, slightly sinuate near middle, lobe on outer margin before finger-like apical process.

Last ventral segment of female slightly less than twice as wide as length at middle, latero-posterior margin unevenly rounded.

Types: Holotype ♂, April 18, 1927, allotype ♀, July 7, 1926, Sanford, Florida, E. D. Ball, in the National Museum, Washington, D. C. One ♂ paratype, Sanford, Florida, July 7, 1926, E. D. Ball, on hand for study.

Additional Material Studied: (Florida) Ft. Mead, Branford, La Belle, Childs, Elfers, Sanford, Gainesville.

Host Plants: Ball (1932) writes, "Nymphs and adults were taken commonly in Florida on the fetter bushes (*Pieris* sp.)."

Comparative Notes: The male of this species somewhat resembles *scriptus*, but the female is very light and quite distinctively colored.

42. *Scaphytopius (Cloanthanus) verecundus* (Van Duzee)

Platymetopius verecundus, Van Duzee, Ann. Ent. Soc. Amer., III, p. 227, 1910.

Resembling *magdalensis*, but smaller, with a longer crown and without lateral process on paraphysis. Length: female 4.2 mm., male 4 mm.

Color: Crown mottled brown with sometimes a reddish tinge and white markings as follows: incomplete narrow line along anterior margin, wedge and oblique line on each side; two large irregular marks sometimes fused between each eye and wedge, and a slender line about size of wedge on each side of median suture; on posterior margin, a large spot at middle and a smaller one next each eye. Pronotum usually somewhat lighter than crown, fuscous markings thickest near posterior margin, light vittae usually evident, especially on sides. Scutellum orange with typical light markings. Clypeus mottled brown and fulvous with irregular light line along posterior margin; relatively long sharksmouth. Lorae and clypellus mottled brown, with apex of clypellus black. Genae mottled, darkest along lateral margins; irregular area next lorae, vitta behind eye and shorter ones near ocellus and antenna, white. Forewing semi-hyaline fulvous with irregular milky aeroles throughout; veins darkest at apex and on costa; outer anteapical cell usually darkest.

Structural Characteristics: Crown over twice as long as width between eyes, anterior margin almost straight on each side of relatively sharp crown, especially in female; wedge slightly less than one-fourth length of crown. Pronotum less than two-thirds as long as crown, about two and one-half times as wide as length at middle and three and one-half times length behind eyes. Clypeus almost two and one-half times as long as width at ocelli; only slightly sinuate near antennae, slight depression at end of sharksmouth.

Clypellus broadest near apex. Face in lateral view concave between anterior margin of eyes. Forewing with claval veins approaching each other at cross-vein, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin oval; anterior margin with lobe on median half. Paraphyses about two and one-half times as long as styles, slender, enlarged on outer fourth before sharp apices. Aedeagus in lateral view almost straight and parallel-margined, small teeth on dorsal margin. Styles about three times as long as greatest width, sinuate just before middle, lobed on outer margin before a finger-like process on apical third.

Last ventral segment of female slightly less than twice as wide as length at middle, latero-posterior margin rounded to a broad, short, median lobe.

Types: Lectotype ♀, Fort Myers, Florida, May 3-5, 1908, Van Duzee, in the National Museum, Washington, D. C., here designated. This was the only cotype located.

Material Studied: (Florida) Sanford, Hobe Sound, New Port Richey, Hilliard, Wakulla, Branford, Yankeetown, Hibernaria, Alachua Co., Lacoochee and Old Town. (Georgia) Adel, Folkston and Okefenokee Swamp. (Mississippi) Ireland. (South Carolina) Plantersville, Conway and New Bern. (North Carolina) Shallotte, Wilmington and Rocky Point.

Host Plants: Ball (1932) writes "—taken abundantly at Sanford, Florida, on mixed stands of low shrubs of the families *Ericaceae* and *Vacciniaceae* growing in flat woods."

Comparative Notes: The sharp crown and reddish color readily separate this species from any other.

43. *Scaphytopius (Cloanthanus) insolitus* Hepner

Scaphytopius (Cloanthanus) insolitus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 99, 1946.

Resembling *verecundus* somewhat, but smaller, with shorter crown and lobed genital paraphyses. Length: female 3.4 mm., male 3 mm.

Color: Crown mottled reddish, with light markings as follows: thin wedge, three pairs of long marks in band before eye, the median pair often united with a pair of spots near median suture on posterior margin. Pronotum, scutellum and face more or less mottled reddish-fulvous, sharksmouth indicated. Forewing translucent dark fulvous, becoming fuscous on coastal and apical margins.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, anterior margin almost straight on each side of pointed apex. Pronotum about four-fifths as long as crown, two and one-third times as wide as length at middle and four and one-half times length behind eyes. Clypeus twice as long as width at ocelli, somewhat sinuate at antennae. Clypellus broad and only slightly enlarged at apex. Face somewhat convex in lateral view. Forewing with typical venation, vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve somewhat wider than length at middle, posterior margin bell-shaped, anterior margin with large lobe on median half. Aedeagus in lateral view straight, converging toward blunt apex, toothed along dorsal margin. Paraphyses slender on basal two-thirds, somewhat enlarged toward apices with small, pointed lateral lobes. Styles about two and one-half times as long as basal width, somewhat sinuate on basal fourth, slightly lobed on outer margin before finger-like process on apical third.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin rounded.

Types: Holotype ♂, allotype ♀, Sanford, Fla., June 17, 1927, E. D. Ball, in the National Museum, Washington, D. C.

Host Plants: The host plant is not known.

Comparative Notes: This small species, reddish and distinctively marked, is undoubtedly rare, as only the one pair is known.

44. *Scaphytopius (Cloanthanus) magdalensis* (Provancher)

Platymetopius magdalensis, Provancher, L., *Petite Faune Entomologique du Canada* (VIII, Hemiptera) III, p. 275, 1889.

Platymetopius obscurus, Osborn, *Ohio Nat.*, V: p. 274, 1905.

Platymetopius carolinus, Lathrop, *Ohio Jour. Sci.*, XVII: p. 123, 1917.

Cloanthanus atratus, DeLong, D. M., *Ohio Jour. Sci.*, VL: p. 27, 1945.

Cloanthanus vaccinium, DeLong, D. M., *Ohio Jour. Sci.*, VL: p. 27, 1945.

Resembling *acutus*, but with shorter crown, with different color pattern, a uniformly colored face and with a sharp process on genital paraphysis near middle. Length: female 4.8 mm., male 4.5 mm.

Color: Crown mottled fulvous-brown with light markings as follows: wedge, irregular markings from eye along anterior margin; two or three pairs of spots, sometimes fused, forming a very irregular band across crown before eyes; two pairs of spots on posterior margin, one pair next median suture, the other next eyes. Pronotum fulvous-brown, more or less irrorate with dark, light

vittae usually very faintly indicated. Scutellum fulvous with typical white markings. Clypeus brown and light mottled, darkest in area of long sharksmouth. Lorae and clypellus as in clypeus, but with a large light spot on each loral sclerite and apex of clypellus infuscated. Genae same color as clypeus, darkest on disc, white vitta behind eye and shorter ones near ocellus and antenna, distinct. Forewing semihyaline yellow with numerous milky aeroles; veins brown, becoming fuscous at apex and on costa, darker in males.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, anterior margin slightly convex on each side of bluntly pointed apex; wedge about one-fourth length of crown. Pronotum almost as long as crown in male, shorter in female, about two and one-half times as wide as length at middle and a little less than four times length behind eyes. Clypeus twice as long as width at ocelli, slightly sinuate at antennae. Clypellus slightly enlarged at apex. Forewing with typical venation, numerous vein-like marks in brachial cell and nine or ten recurved veins to costa.

Genitalia: Valve about three-fourths as long as greatest width, roughly triangular, posterior margin somewhat convex on each side of bluntly pointed apex; anterior margin with broad, short lobe. Paraphyses long, slender on basal half, small, sharp process near middle, enlarged beyond to sharp apices. Aedeagus in lateral view rounded near base, almost parallel-margined on basal half, slightly narrowed to blunt apex; small tooth-like processes on dorsal margin near apex. Styles about twice as long as basal width, greatly sinuate near middle, large lobe on outer margin before finger-like apical process.

Last ventral segment of female slightly over twice as long as greatest width, latero-posterior margin roughly circular.

Types: The type of *magdalensis* should be in the Provincial Museum, Quebec, Canada. The type of *obscurus* is in the Osborn Collection, Ohio State University, Columbus, Ohio. The type of *carolinus* was destroyed in the Clemson College fire some years ago. Types of *atratus* and *vaccinium* in Illinois Natural History Survey collection, Urbana, Ill. Paratypes of *obscurus*, *atratus* and *vaccinium* were on hand for study.

Additional Material Studied: Specimens are on hand from many points from Florida to Maine west of the Rocky Mountains, as well as from eastern Canada.

Host Plants: Ball (1932) writes "Dr. Osborn credits this to blueberries. Dr. Irene Debrosky tells me that she has carried this species through from egg to adult on the cranberry. The writer has taken this dark-faced species while sweeping shrubs in low damp places in northern Wisconsin and again at Woods Hole, Massachusetts, both situations where cranberries are abundant." Horsfall (1916) writes of the species in Missouri "From blackjack brush in July." Lowry (1933) regarding this species in New Hampshire writes "rare on *Vaccinium pennsylvanicum*."

Comparative Notes: As might be expected from its wide range, this species varies considerably. Specimens from Florida are much smaller, but the small process near middle of paraphysis readily separates this species from any other, with the exception of *nigrifrons*, which is much darker.

45. *Scaphytopius (Cloanthanus) scriptus* (Ball)

Platymetopius scriptus, Ball, E. D., Ent. News, XX: p. 165, 1909.

Cloanthanus varius, DeLong, D. M., Ohio Jour. Sci., VL: p. 26, 1945.

Color: Crown brown to fuscous in male, fulvous in female, with light markings as follows: narrow line along anterior margin; wedge and short oblique line on each side; two irregular marks on each side, often coalesced, half-way between eye and wedge, and a smaller, longer mark, often indistinct, extending on each side of median suture from near wedge to base of crown; two pairs of spots on posterior margin, one pair near median suture and another next eyes. Pronotum same color as crown, light vittae irregular, but present. Scutellum same color as crown with typical light markings. Face about same color as crown with light markings as follows: relatively long sharksmouth, vitta behind eye and shorter ones at ocelli and antennae. Forewing semihyaline fulvous with cells in corium of male almost entirely fuscous except next veins, fuscous area in female restricted to outer anteapical cell and adjoining area of costa; light aeroles throughout, but especially near apex.

Structural Characteristics: Crown about one and one-third as long as width at ocelli, anterior margin slightly convex on each side of bluntly pointed apex; wedge about one-fourth length of crown. Pronotum slightly shorter than crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus over twice as long as width at ocelli, evenly narrowed beyond antennae in male, slightly sinuate in female; slight concavity at end of sharksmouth. Clypellus relatively stout, broad-

ened near apex. Face in lateral view somewhat concave between anterior margin of eyes. Forewing with typical venation, several vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin slightly convex on each side of bluntly pointed apex; anterior margin with broad, rounded lobe on median half. Paraphyses extending beyond plates, almost parallel-margined to small lateral process on outer fourth before sharp apices. Aedeagus in lateral view almost as long as style, tooth-like marks on dorsal surface, apex flattened. Styles about three times as long as basal width, inner margin abruptly enlarged near middle, outer margin with distinct lobe on middle before finger-like apical process.

Last ventral segment of female one and two-thirds as wide as length at middle, latero-posterior margin evenly rounded to small median lobe.

Types: Lectotype ♂, Onaga, Kansas, May 27, 1902, here designated, in the National Museum, Washington, D. C. It is presumed that the collector was Crevecoeur. Allotype ♀ and one ♀ paratype, Douglas Co., Kansas, Aug., 1923, W. Robinson, here designated, in the Snow Entomological Collections. Additional paratype ♀ ♀ as follows: (Kansas) 1, Leavenworth Co., July 1, 1924, R. H. Beamer; 3, Douglas Co., June 6, 1918, C. P. Alexander and 1, Douglas Co., Aug. 28, 1928, P. B. Lawson. (Indiana) 1, Gary, June 24, 1934, M. W. Sanderson. (Tennessee) 1, Clarksville, July 4, 1917, D. M. DeLong and 2, Clarksville, June 26, 1914. (Maryland) 1, Annapolis, Sept. 27, 1931, 1, June 2, 1932, P. W. Oman; 1, Plummers Island, Sept. 2, 1913, R. C. Shannon and 1, Aug. 4, 1907, W. L. McAtee. (Virginia) 1, Dismal Swamp, Aug. 13, 1934, R. H. Beamer; 1, Chincoteague Island, Sept. 22, 1938, J. C. Bridwell; 1, Nelson Co., June 19, 1925, W. Robinson and 1, L. Drummond, Sept. 10, 1933, P. W. Oman. (Mississippi) 1, Shuqulak, July 16, 1930, R. H. Beamer.

Host Plants: The host plant is not known.

Comparative Notes: This species is found over most of the eastern half of the United States, except the extreme south, and is distinguished by its short crown with small markings and heavily marked forewings.

46. *Scaphytopius (Cloanthanus) scriptus meridianus* Hepner

Scaphytopius (Cloanthanus) scriptus subsp. *meridianus*, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 100, 1946.

Resembles *scriptus*, but lighter color, longer crown and more southern in distribution. Length: female 4.7 mm., male 3.8 mm.

Color: Crown mottled brownish, with light markings as follows: wedge; circular area on apical half, broken by three lines behind wedge; irregular area along posterior margin. Pronotum pale fulvous, irregularly marked with brown, vittae only lightly indicated. Scutellum fulvous with typical markings indicated. Face fulvous, mottled with brown, light sharksmouth and vitta behind eye, evident. Forewing semihyaline fulvous, veins and irrorations fuscous in male, fulvous in female.

Structural Characteristics: Crown slightly less than twice as long as width between eyes, anterior margin straight to slightly convex on each side of pointed apex. Pronotum about three-fourths as long as crown, about two and one-third times as wide as length at middle and three and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, slightly, if any, sinuate at antennae. Clypellus broad, enlarged and rounded at apex. Face in lateral view straight in male, slightly concave between anterior margin of eyes in female. Typical venation, vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin bell-shaped; anterior margin with broad, short lobe on median third. Shaft of aedeagus in lateral view slightly curved, almost parallel-margined to blunt apex, rugulose area on dorsal margin near apex. Paraphysis slender on basal two-thirds, coiled near middle, slender lateral process before enlarged, sharply pointed, apical portion. Styles about three times as long as basal width, slightly sinuate near middle, distinct lobe on outer margin before bluntly pointed, finger-like apical process.

Last ventral segment of female slightly more than half as long as greatest width, latero-posterior margin rounded.

Types: Holotype ♂, allotype ♀, 2 ♂♂, and 1 ♀ paratypes, Branford, Florida, July 31, 1930, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Florida) 1 ♂, Branford, Aug. 4, 1939, R. H. Beamer; 1 ♀, Branford, July 16, 1934, R. H. Beamer; 1 ♀, Ft. Mead, Aug. 13, 1930, L. D. Tuthill; 4 ♀♀, 1 ♂, Ft. Mead, Aug. 13, 1930, R. H. Beamer;

2 ♀ ♀, Ft. Mead, Aug. 13, 1930, P. W. Oman; 3 ♀ ♀, 2 ♂ ♂, Hilliard, July 28, 1934, M. E. Griffith; 1 pair, Hilliard, Aug. 31, 1930, L. D. Tuthill; 1 pair Hilliard, Aug. 9, 1930, John Nottingham; 1 ♂, Hilliard, July 28, 1934, 1 ♀, Aug. 31, 1930, R. H. Beamer; 2 ♂ ♂, Hilliard, Aug. 19, 1930, P. W. Oman; 1 ♂, Waldo, Aug. 18, 1930, R. H. Beamer; 1 ♀, Wildwood, Aug. 2, 1930, John Nottingham; 5 ♀ ♀, 3 ♂ ♂, Suwanee Spgs., Aug. 2-3, 1939, R. H. Beamer and 1 ♂, Pensacola, July 12, 1934, R. H. Beamer. (Georgia) 2 ♀ ♀, Okefenokee Swamp, July 27, 1939, and 1 ♀, Aug. 3, 1934, R. H. Beamer. (Louisiana) 1 ♂, "La. Carl F. Baker."

Additional specimens, somewhat larger, are on hand from Mississippi and Arkansas.

Host Plants: The host plant is not known.

Comparative Notes: This species might be confused with *verecundus* in Florida but lacks the red color, has a shorter crown and is easily separated by the male genitalia.

47. *Scaphytopius* (*Cloanthanus*) *angustatus* (Osborn)

Platymetopius angustatus, Osborn, Rept. of New York State Entomologist (20th Report), p. 518, 1905.

Resembles *acutus*, but pale greenish-fulvous in color, different color pattern on crown and face not greatly darkened on lateral margin. Length: female 5 mm., male 4 mm.

Color: Crown pale greenish-fulvous with indistinct darker markings, especially next eyes and near wedge. Pronotum gray to fulvous with brown irrorations, often lightest on anterior and lateral margins. Scutellum same color or slightly darker than pronotum, typical light markings usually at least indicated. Face about same color as crown, sharksmouth indicated and a few dark irrorations near basal margin. Forewing semihyaline fulvous, often with a faint greenish tinge, light aeroles in anteapical and apical cells and along costa; veins concolorous except at apex and along costa.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, almost straight margined on each side of blunt apex; wedge about one-third length of crown. Pronotum slightly over twice as wide as length at middle and about four times length behind eyes. Clypeus almost straight margined. Clypellus relatively slender, widest near apex. Face in lateral view almost straight. Forewings with venation usually obscured, five or six recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin with sides only slightly convex to a sharp apex; anterior margin only slightly concave to a short, broad median process. Paraphyses slender, about twice as long as styles, somewhat coiled on basal half, narrowest on outer third, only slightly enlarged before sharp apices. Aedeagus simple, curved near middle, slightly produced on dorsal margin. Styles almost three times as long as basal width, constricted on basal third, outer margin lobed on apical third to finger-like apical process.

Last ventral segment of female about one and one-half times as wide as length at middle, latero-posterior margin rounded to a small lobe on each side of median notch.

Types: Lectotype ♀, lectoallotype ♂, Cold Spr. Harbor, New York, Aug. 18, 1904, H. Osborn, here designated, in the Osborn Collection, Ohio State University, Columbus, Ohio. The original description gives Oyster Bay as the collection locality, but Prof. Osborn has said that these two localities are the same, as Cold Spring Harbor is within Oyster Bay. One specimen on hand from the type series.

Additional Material Examined: (Minnesota) Itasca Park and Bena. (Wisconsin) Florence and Brule. (Maine) Fryeburg.

Host Plants: Ball (1932) writes "—has taken this species from Jack pine in several places in northern Wisconsin and has examined specimens from New Hampshire, (Lowry) taken from pitch pine." Lowry (1933) writes regarding the species in New Hampshire "common on pitch and red pine."

Comparative Notes: This greenish species has the crown pattern faint and variable. The color is quite distinctive and so far as known, is the only species in the genus found on pine.

48. *Scaphytopius (Cloanthanus) calliandrus* (Ball)

Nasutoideus calliandrus, Ball E. D., Can. Ent., LXIII: p. 222, 1931.

Resembling *loricatus*, but with lighter scutellum, much shorter crown and with genital paraphyses. Length: female 4 mm., male 3.8 mm.

Color: Crown mottled fuscous with light markings as follows: wedge; two pairs of marks along anterior margin, a small pair just in front of eyes and a larger oblique pair about half way from eye to wedge; a small dot on each side of posterior end of wedge; on posterior margin, a dot next each eye and one or two pairs of dots

between these. Pronotum same color as crown with light vittae indicated, especially on lateral margins. Scutellum ivory to orange, with a few black marks, especially along base and at apex. Face ivory to pale fulvous with irregular brown irrorations, often reduced; sharksmouth small; white vitta behind eye and shorter ones near ocelli and antennae. Forewing semihyaline white with heavy irrorations and areas throughout; veins dark.

Structural Characteristics: Crown about one and two-fifths times as long as width between eyes, anterior margin slightly convex on each side of blunt apex; wedge short. Pronotum about as long as crown, slightly less than two and one-half times as wide as length at middle, and four and one-half times length behind eyes. Clypeus relatively slender, about two and one-half times as long as width at ocelli, slightly sinuate near antennae. Clypellus relatively slender and enlarged near apex. Face in lateral view distinctly convex. Forewing with typical venation, several vein-like markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin straight on each side of truncate apex; anterior margin concave on each side of a slender, rounded lobe at middle. Paraphyses extending well beyond apex of plates, almost parallel-margined to sharp apices. Aedeagus in lateral view "V"-shaped, shaft more slender but about same length as basal part. Styles about three times as long as width at base, "dog-legged" near base, almost parallel-margined to small lobe on outer margin before small finger-like apical process.

Last ventral segment of female about twice as wide as length at middle, posterior margin with a lobe on outer margin and a smaller lobe at middle, with a slight median notch.

Types: Holotype ♀, Tucson, Ariz., June 22, 1930, allotype ♂, Tucson, Ariz., June 21, 1930, E. D. Ball, in the National Museum, Washington, D. C. Two paratypes on hand, ♂, Coolidge Dam, Ariz., May 18, 1930, E. D. Ball and ♀, Tucson, Ariz., Oct. 20, 1929, E. D. Ball.

Additional Material Studied: (California) Mountain Spgs., and Indio. (Arizona) Baboquivari Mts., Miami, Sabino Canyon, Gila Co., Mescal, Patagonia, Tubac, Hope, Nogales, Huachucua Mts., Castle Hot Spgs., Mustang Mts., Alamo, Ruby, Safford, Arivaca, Vail, Congress Jct., Santa Catalina Mts., Tombstone, Atascosa Mts., Quinlan Mts., La Osa River, Empire Mts., Naco and Hereford.

(Texas) San Ygnacio, Three Rivers, Catarina, Alpine, Marathon, Valentine, George West, Corrizo Spgs., Starr Co. and Presidio Co.

Host Plants: Ball (1932) writes "—has been found only on the low clumps of the fairy duster (*Calliandra eriophylla*) in Arizona."

Comparative Notes: This small, dark species is easily recognized by the yellowish to orange scutellum in sharp contrast to the much darker forewings.

49. *Scaphytopius (Cloanthanus) analis* var. *castranus* (Ball)

Convelinus analis var. *castranus*, Ball, E. D., Can. Ent., LXIII: p. 228, 1931.

Somewhat resembling *nigricollis*, but gray with dark dots, crown more pointed and with genital paraphyses. Length: female 4.1 mm., male 3.8 mm.

Color: Crown ivory with pale brown dots and irrorations; wedge and irregular area on each side without irrorations. Some specimens have only a few dots. Pronotum white with sparsely-spaced dark dots throughout. Scutellum ivory with an orange spot near each basal corner and a few dark dots, especially near apex. Face ivory with scattered dark dots, thickest behind eyes. Forewing semihyaline white with scattered dots, especially along veins; apex and costa darkest.

Structural Characteristics: Crown about one and one-third as long as width between eyes, anterior margin slightly convex on each side of bluntly pointed apex; wedge about one-third length of crown, sometimes indistinct. Pronotum almost as long as crown, two and one-half times as wide as length at middle, and four and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly constricted at antennae. Face in lateral view distinctly convex. Forewing with typical venation, several vein-like marks in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of blunt apex; anterior margin slightly concave on each side of rounded median lobe. Paraphyses slender, almost parallel-margined to sharp apices. Aedeagus in lateral view "U"-shaped, shaft about as long, but more slender than base. Styles about three times as long as basal width, only slightly narrowed at middle, small lobe on outer margin before finger-like apical process.

Types: Holotype ♀, June 21, 1930, allotype ♂, May 10, 1930, both Tucson, Arizona, E. D. Ball, in the National Museum, Washington, D. C.

Material Studied: (Arizona) Tucson, Tempe and Hope.

Host Plants: Ball (1932) writes that this species is confined strictly to the desert iron wood (*Olneya testota*).

Comparative Notes: This species was originally placed in the genus *Convelinus*, but the genitalia are much different from *nigricollis*, showing more resemblance to *calliandrus*. This might be a synonym of *analisis*, as that species was not examined by the author.

50. *Scaphytopius (Cloanthanus) radiatus* Hepner

Scaphytopius (Cloanthanus) radiatus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 101, 1946.

Resembling *loricatus*, but lighter, with a dark face, different markings on crown and with genital paraphysis. Length: female 4 mm., male 4 mm.

Color: Crown brown and white mottled, with the white markings giving the appearance of lines radiating toward the apex. Pronotum gray with fuscous markings; vittae evident, especially on sides. Scutellum dark orange to brown with typical light markings. Clypeus fulvous with brown irrorations excepting small sharksmouth. Clypellus and lorae same as clypeus. Genae same as clypeus, darkest behind eye, light vitta behind eye and shorter ones near ocellus and antenna, evident. Forewing semihyaline fulvous with white aeroles or areas; many brown vermiculations throughout especially in male, darkest at apex and on costa.

Structural Characteristics: Crown slightly less than one and one-half times as long as width between eyes; anterior margin slightly convex on each side of bluntly pointed apex; wedge about one-fifth length of crown. Pronotum somewhat shorter than crown, two and one-fourth times as wide as length at middle and about four times length behind eyes. Clypeus slightly more than twice as long as width at ocelli, only slightly sinuate, if at all, at antennae. Face in lateral view convex in male, concave between anterior margin of eyes in female. Forewing with typical venation; several vein-like marks in brachial cell and about nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin broadly convex on each side of small teat-like process at apex; anterior margin with small lobe on median half. Paraphyses long, slender and almost parallel-margined to sharp apices. Aedeagus in lateral view roughly "L"-shaped, shaft longer but narrower than basal portion. Styles about four times as long as basal width,

slender, with narrow, long lobe on outer margin before outwardly directed apical process.

Last ventral segment of female almost twice as wide as length at middle, lateral margins slightly convergent, posterior margin with small lobe at each side and a broader lobe on each side of small median notch.

Types: Holotype ♂, allotype ♀, and 2 ♂ and 6 ♀ paratypes, Three Rivers, Texas, June 27, 1938, R. H. Beamer, in the Snow Entomological Collections. One ♂ paratype, Sinton, Texas, Dec. 25, 1945, R. H. Beamer.

Host Plants: The host plant is not known.

Comparative Notes: The brown crown, with light lines radiating toward apex, easily separates this species from any other in southern Texas. The male collected in December is darker, with shorter lineations on crown, but the genitalia are almost identical to the type series. From the description of *flavens* DeLong, this species differs in the markings on the crown and with many more markings on the forewing.

51. *Scaphytopius (Cloanthanus) modicus* Hepner

Scaphytopius (Cloanthanus) modicus, Hepner, Jour. Kan. Ent. Soc., XIX: p. 102, 1946.

Resembling *magdalensis*, but smaller, lighter in color, a different pattern on crown and greatly produced last ventral segment of female. Length: female 3.6 mm., male 3.2 mm.

Color: Crown fulvous except for light markings as follows: short wedge; most of area before eyes; two pairs of spots along posterior margin, one next each eye and one on each side of median suture. Pronotum fulvous with anterior margin lightest; many brown irrorations in male, almost none in female; vittae evident. Scutellum fulvous to orange with typical light markings. Clypeus ivory to fulvous with dark dots, excepting small sharksmouth. Clypellus and lorae same as clypeus, but with fewer markings. Genae darker than clypeus, with vitta behind eye and shorter ones near ocelli and antennae, distinct. Forewing fulvous with few irrorations.

Structural Characteristics: Crown almost one and one-half times as long as width between eyes, slightly convex on each side of bluntly pointed apex; wedge very short. Pronotum almost as long as crown, about two and one-half times as wide as length at middle and four and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, very slightly sinuate at an-

tennae. Clypellus slightly enlarged near apex. Face in lateral view distinctly convex in male, almost straight in female. Forewing with typical venation, several vein-like marks in brachial cell and about nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin convex on each side of small median lobe; anterior margin with long, bluntly pointed lobe. Plates very slender, concave on inner margin. Paraphyses relatively stout, slightly longer than plates, broadest on outer fifth before sharply pointed apices. Aedeagus in lateral view short, curved and parallel-margined. Styles about twice as long as basal width, constricted near middle, lobed on outer margin before sharply pointed, outwardly projecting apical process.

Last ventral segment of female about two-thirds as long as greatest width, latero-posterior margin with very long, notched median lobe.

Types: Holotype ♂, allotype ♀, Cameron Co., Texas, Aug. 3, 1928, R. H. Beamer, in Snow Entomological Collections.

Host Plants: The host plant is not known.

Comparative Notes: This is one of the smallest species in southern Texas and the genitalia are quite distinctive—the slender plates, short styles and stout paraphyses of the male and the strongly produced last ventral segment of the female are unlike any other species in the area.

52. *Scaphytopius (Cloanthanus) pallidicapitatus* Hepner

Scaphytopius (Cloanthanus) pallidicapitatus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 103, 1946.

Resembling *castranus* but darker, more distinct pattern on crown and with shorter aedeagus. Length: female 4 mm., male 4 mm.

Color: Crown fulvous marked with brown; wedge, irregular band before eyes and posterior margin without markings. Pronotum gray with sparsely spaced dark dots, vittae visible on lateral margins. Scutellum yellow to fulvous, darkest near basal corners. Face yellow to fulvous with sparsely spaced dots throughout, especially on lateral margins of genae; sharksmouth small; apex of clypellus only slightly darkened. Forewings semihyaline white, darkened posteriorly; veins brown, darkest on posterior and costal margins.

Structural Characteristics: Crown slightly longer than width between eyes, anterior margin slightly convex on each side of blunt apex; wedge relatively small. Pronotum about as long as crown, almost two and one-half times as wide as length at middle and

about five times length behind eyes. Clypeus slightly over twice as long as width at ocelli, slightly sinuate near antennae. Clypellus definitely constricted near base and enlarged near apex. Face in lateral view convex. Forewings with vein-like markings in brachial cell, about eleven recurved veins to costa and sometimes extra veins in clavus.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of truncate lobe on median third. Plates slender. Paraphyses slender, extending slightly beyond apex of plates, apices pointed. Aedeagus in lateral view very short, slightly curved and parallel-margined. Styles about four times as long as basal width, almost parallel-margined to rounded outer margin before sharply pointed apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margins slightly convergent, posterior margin rounded to very small median notch.

Types: Holotype ♂, allotype ♀, and 3 ♂ and 2 ♀ paratypes, Mission, Texas, July 5, 1938, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes from Texas as follows: 2 ♀ ♀, Starr Co., July 30, 1928, 4 ♀ ♀, 2 ♂ ♂, July 5, 1938, R. H. Beamer; 1 ♀, Starr Co., July 30, 1928, L. D. Beamer; 1 pair, Hidalgo Co., July 30, 1928, R. H. Beamer and 3 pairs, 12 miles west of Mission, Dec. 26, 1945, R. H. Beamer.

Host Plants: The host plant is not known.

Comparative Notes: The very light crown, with speckled face, is distinctive. A specimen from Calcasieu Parish, La., is probably this species, but the abdomen is missing. This species is near *brevis* but the genitalia are different.

53. *Scaphytopius (Cloanthanus) nigriviridis* (Ball)

Platymetopius nigriviridis, Ball, E. D., Ent. News, XX: p. 163, 1909.

Resembles *trilineatus* in the female, but much smaller and lighter; the male has a much shorter crown, somewhat resembling *castranus*, but more slender and without dots on dorsum. Length: female 4.5 mm., male 3.8 mm.

Color: Crown greenish and with three or four black vittae on each side of median suture, restricted to apical two-thirds. Pronotum yellowish-green, usually darkest on disc, without markings except for sometimes an indication of vittae. Scutellum slightly lighter than pronotum and either without markings or, at most, with two or

three short brown lines along anterior margin. Face greenish-yellow, without markings except for a few brown vermiculations along base in area of sharksmouth and sometimes behind eye; sharksmouth short in the male, long in the female. Forewing semihyaline ivory on clavus, brachial, apical and anteapical cells, colorless on remainder of wing; sometimes clouded with brown or with five brown spots on inner half of clavus and apical half of corium; veins colorless except for two or three recurved veins to costa.

Structural Characteristics: Crown about one and one-half times as long as width between eyes in male, two and one-half times basal width in female; anterior margin convex on each side of broadly pointed apex in male, somewhat concave on each side in female; wedge short in male, half length of crown in female. Pronotum three-fourths as long as crown in male, one-half length of crown in female; two and one-fourth times as wide as length at middle and four times length behind eyes. Clypeus about twice as long as width at ocelli in male, two and two-thirds times width in female; only slightly sinuate at antennae, if at all. Clypellus slender, only slightly enlarged at apex. Face in lateral view convex in male, almost straight in female. Forewing with about five recurved veins on costa (with only two or three darkened) and sometimes extra cross-veins in clavus.

Genitalia: Valve wider than greatest length, posterior margin slightly concave near base, remainder evenly rounded; anterior margin concave on each side of relatively long median lobe. Paraphyses extending well beyond plates, enlarged, bulb-like near sharp apices. Aedeagus in lateral view broad and "U"-shaped. Styles short, less than three times as long as basal width, sinuate near middle, lobed on dorsal margin just before short, slender, outward-projecting apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margin slightly convex and converging; posterior margin with slight concavity at middle, small lobe on each side and another small lobe on each outer margin, giving a four-lobed appearance.

Types: Holotype ♀, allotype ♂, Tiajuana, Calif., June 15, 1908, in the National Museum, Washington, D. C., here designated.

Material Studied: (Nevada) Las Vegas. (California) Dulzura. (Arizona) Arivaca, Congress Jct., Hereford, Baboquivari Mts., Santa Rita Mts., Alamo, Yarnell, Tucson Mts., Tubac, Mescal,

Patagonia, Miami, Huachucua Mts., Pima Co., Hereford and Bradshaw Mts. (New Mexico) Eddy Co., and White City. (Texas) Davis Mts.

Host Plants: Ball (1932) writes "—taken by the writer in abundance, both nymphs and adults, on *Hymenoclea monogyra* in southern Utah and Arizona." Specimens were examined from Las Vegas, Nevada, labeled "*Hymenoclea salsola*."

Comparative Notes: The greenish color readily separates this species from any other in the genus found in the Southwest. The difference in the length of the crown is not always so great, as some short crowned females will be found, although never so short as in the males.

54. *Scaphytopius (Cloanthanus) nigriviridis dixianus* (Ball)

Platymetopius nigriviridis var. *dixianus*, Ball, E. D., Ent. News, XX: p. 163, 1909.

Resembles *nigriviridis* but brownish in color and with aedeagus longer and less curved. Length: female 4.5 mm., male 4 mm.

Color: Crown ivory to yellow with brown lineations on apical two-thirds; same color pattern as in *nigriviridis*. Pronotum ivory with vittae indicated by brown dots. Face as in *nigriviridis*, with the green replaced by yellow. Forewings more opaque ivory than *nigriviridis*, with most of wing, excepting brachial cell, containing brown clouded areas, especially in female; usually about three dark recurved veins in costa, others ivory to yellow.

Structural Characteristics: About the same as in *nigriviridis*, except usually with somewhat shorter crown.

Genitalia: About the same as in *nigriviridis* but with aedeagus in lateral view stout, almost parallel-margined, only slightly curved; and with paraphyses narrower near apex.

Types: Holotype female, St. George, Utah, July 24, 1908, in the National Museum, Washington, D. C., here designated. Allotype ♂ and 30 ♂ paratypes, Wickenburg, Ariz., July 27, 1933, R. H. Beamer, in the Snow Entomological Collections. Additional ♂ paratypes as follows: (Utah) 1, St. George, Sept. 28, 1928, E. W. Davis and 3, St. George, July 28, 1935, light trap. (California) 3, Palm Spgs., Dec. 22, 1941, R. H. Beamer and 1, Mt. Spgs., July 25, 1938, R. H. Beamer. (Arizona) 2, Tucson, June 18, 1933, R. H. Beamer; 5, Tucson, Nov. 19, 1931, and 1, Sept. 14, 1930, E. D. Ball; 4, Tucson, June 18, 1933, P. W. Oman; 7, Gila Bend, April 26, 1935, E. D. Ball; 19, Red Rock, Aug. 28, 1933, P. W. Oman; 2, Congress

Jct., Aug. 15, R. H. Beamer; 1, Ajo, July 23, 1938, R. H. Beamer and 3, Yuma, Oct. 30, 1931, E. D. Ball.

Host Plants: Ball (1932) writes "—has been taken sparingly from *Hymenoclea salsola* in the same regions."

Comparative Notes: Specimens collected in the winter have a somewhat shorter crown than those collected in the summer. This form seems to be restricted to Arizona and adjacent areas of California and Utah, a somewhat narrower range than for *nigriviridis*.

55. *Scaphytopius (Cloanthanus) heldoranus* (Ball)

Nasutoideus heldoranus, Ball, E. D., Can. Ent., LXIII: p. 226, 1931.

Resembling *desertanus* but with large black spot near apex of crown and black lines to posterior margin and with genital paraphyses. Length: female 3.8 mm., male 3.4 mm.

Color: Crown white to ivory with large, irregular black blotch near apex and three black lines from this to base; usually a less distinct line inside each eye. Pronotum gray with dark dots, vittae usually faintly indicated. Scutellum white to ivory with a few dark markings along base and on disc. Face light with black dots, lightest on disc of clypeus, darkest behind eye and between anterior margin of eyes; line behind eye and long sharksmouth at least indicated. Forewings opaque white, scattered brown dots throughout; veins consisting of brown dots anteriorly, becoming black lines on costa and at apex.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, almost straight on each side of bluntly pointed apex; wedge short and an irregular circle. Pronotum about three-fourths as long as crown, slightly more than twice as broad as length at middle and about four and one-half times length behind eyes. Clypeus about two and one-half times as long as width at ocelli, slightly concave along sharksmouth, somewhat constricted at antennae. Clypellus stout, only slightly enlarged, if any, near apex. Face in lateral view distinctly convex. Forewing with typical venation, several vein-like markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about one and one-half times as wide as length at middle, posterior margin broadly rounded, anterior margin convex. Paraphyses long, straight and slender to sharp apices. Aedeagus small, "J"-shaped, slightly broadest near apex. Styles almost three times as long as basal width, sinuate near middle, slightly lobed on outer margin before finger-like apical process.

Last ventral segment of female about twice as wide as median length, lateral margins convergent, posterior margin convex, with a small, bluntly pointed, median process.

Types: Holotype ♀, allotype ♂, Tombstone, Arizona, June 15, 1930, E. D. Ball, in the National Museum, Washington, D. C. One pair of paratypes, Huachucua Mts., June 15, 1930, E. D. Ball, on hand for study.

Additional Material Studied: (Arizona) Mustang Mts., Oak Creek Canyon, Tombstone, Huachucua Mts. and Patagonia. (New Mexico) Organ, White City and Carlsbad. (Texas) Ft. Stockton, El Paso Co. and Marathon.

Host Plants: Ball (1932) writes "—breeding abundantly on the wild rubber plant (*Parthenium incanum*) in southeastern Arizona."

Comparative Notes: This small desert species is easily recognized by the opaque white forewings and the large black spot at apex of crown.

56. *Scaphytopius (Cloanthanus) vittifrons* Hepner

Scaphytopius (Cloanthanus) vittifrons. Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 104, 1946.

A distinctively marked species, with fuscous-margined, light vitta from sharksmouth to apex of clypeus. Length: female 4.5 mm., male 3.7 mm.

Color: Crown mottled fulvous to brown with broad, fuscous-margined light vittae as follows: along anterior margin from eye to eye, wedge, a long vitta on disc on each side of median suture and an irregular area along median margin of each eye. Pronotum mottled yellow to fulvous with typical vittae distinct and dark-margined. Scutellum yellowish, darkest next each basal corner. Clypeus yellowish, mottled with brown, with fuscous-bordered light marks as follows: line along basal margin joining ocelli, sharksmouth, vitta from near sharksmouth to apex. Clypellus and lorae same color as clypeus, but with fewer dark markings. Genae about same as clypeus, with fuscous-bordered light vittae as follows: behind eye, from apex of eye to lateral margin and next lorae. Forewings opaque white with irregular dark fulvous or light brown clouded areas covering about half of entire wing; veins darkening posteriorly and on costa.

Structural Characteristics: Crown about twice as long as width between eyes, longest in female, anterior margin almost straight on each side of pointed apex; wedge about two-fifths length of crown.

Pronotum about three-fourths as long as crown, proportionately shorter in female, twice as wide as length at middle and three and two-thirds times length behind eye. Clypeus over twice as long as width at ocelli, lateral margins sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewing with a few vein-like marks in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about three-fourths as long as greatest width, posterior margin convex on each side of bluntly pointed apex; anterior margin with short, broad lobe. Paraphyses long, slender and sharply pointed. Aedeagus in lateral view short, curved and almost parallel-margined. Styles almost four times as long as basal width, sinuate on basal third, small lobe on outer margin before long, slender process on apical third.

Last ventral segment of female almost twice as wide as length at middle, lateral margin slightly convex; posterior margin almost straight except for small median lobe.

Types: Holotype male, Concan, Texas, July 6, 1936, R. H. Beamer, in the Snow Entomological Collections. Allotype female, Chisos Mts., Texas, Sept. 19, 1938, D. J. and J. N. Knull, in the Knull Collection, Ohio State University, Columbus, Ohio. One ♀ paratype, El Paso Co., Texas, Aug. 30, 1940, D. J. and J. N. Knull.

Host Plants: The host plant is not known.

Comparative Notes: So far as known, this is the only species north of Mexico with the vitta on the middle of the clypeus, although there are several larger, similarly marked species in México.

57. *Scaphytopius (Cloanthanus) slossonae* (Van Duzee)

Platymetopius slossoni, Van Duzee, E. P., Ann. Ent. Soc. Amer., III: p. 222, 1910.

Resembles *acutus* but smaller, more slender, and with a sharper crown. Length: female 4.5 mm., male 4 mm.

Color: Crown fulvous with light markings as follows: thin line along anterior margin, wedge, long broad areuate line on disc on each side of median suture and two pairs of dots on posterior margin. Light areas are thinly and irregularly lined with brown. Pronotum fulvous, much darker than crown, lightest along anterior margin, scattered brown dots, especially in male; vittae irregular but distinct. Pronotum yellow to fulvous with typical markings. Clypeus, clypellus and lorae yellow except on basal fourth; brown along basal margin between eyes except for long sharksmouth.

Genae lightest next clypeus, dark along lateral margins, vitta behind eye and near ocellus distinct. Forewing semihyaline fulvous with large milky aeroles throughout, heavy fuscous vermiculations in male, lighter in female, darkest on outer anteapical and adjoining costa; veins fuscous in male, lighter in female.

Structural Characteristics: Crown about two and one-fourth times as long as width between eyes, anterior margin straight on each side of sharply pointed apex; wedge about half length of crown. Pronotum about three-fifths as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus almost two and one-half times as long as width at ocelli with slight or no constriction at antennae; shallow concavity along sharksmouth. Clypellus relatively slender and enlarged at apex. Face in lateral view concave between anterior margin of eyes. Forewing with vein-like markings in brachial cell, eight or nine recurved veins to costa and sometimes extra cross-veins in clavus.

Genitalia: Valve slightly wider than length at middle, posterior margin convex on each side of bluntly pointed apex; anterior margin with short median lobe. Paraphyses long, slender, pointed and parallel-margined. Aedeagus slender, almost parallel-margined, slightly curved near base. Styles almost four times as long as basal width, slightly sinuate on basal third, lobed on outer margin before short, slender, outwardly curved apical process.

Last ventral segment of female about three-fifths as long as greatest width, latero-posterior margin almost evenly rounded.

Types: I was unable to locate the types, but one of the Van Duzee series from Crescent City, Florida, was on hand for study.

Additional Material Studied: (Florida) Ft. Myers, Homestead, Coconut Grove, Crescent City, Cedar Keys, Sanford, Lacoochee, Fruitville, Yankeetown, Ft. Mead, Gainesville, La Belle, Palm Beach, St. Marys River, Clearwater, Wildwood, Ft. Pierce, Jacksonville, Edgewater and Dunnellon. (Louisiana) Opelousas.

Host Plants: Ball (1932) writes "—was taken—in abundance everywhere in Florida. In several places larvae and adults were found on pure stands of a narrow-leaved sunflower (*Helianthus angustifolius*)."

Comparative Notes: This species is occasionally confused with *cinereus* in Florida, but in *slossonae* the area between sharksmouth and basal margin of clypeus is darker than remainder of clypeus, while in *cinereus* it is about the same color as remainder of clypeus.

58. *Scaphytopius (Cloanthanus) rubellus* (Sanders and DeLong)

Platymetopius rubellus, Sanders and DeLong, Ann. Ent. Soc. Amer., XII: p. 231, 1919.

Resembling *acutus* but with more slender, pointed crown, reddish in color and with coiled genital paraphyses. Length: female 5 mm., male 4.5 mm.

Color: Crown mottled reddish-fulvous with yellowish markings as follows: thin line along anterior margin, wedge, arcuate vittae on disc often obsolete except at middle, typical spots along posterior margin. Pronotum about same color as crown, vittae usually indicated. Scutellum same as crown, light markings faintly indicated. Face reddish-fulvous, lightest on disc of clypeus, sharksmouth long, vitta behind eye and one near ocellus faint, but visible. Forewing semihyaline reddish-fulvous with light aeroles, especially at apex; veins concolorous, becoming fuscous at apex and on costa.

Structural Characteristics: Crown as long as width between eyes in male, longer in female, anterior margin straight to slightly concave on each side of sharply pointed apex; concavity along wedge and median suture; wedge very narrow and about half length of crown. Pronotum slightly more than half as long as crown, about two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-fourth times as long as width at ocelli in male, longer in female, shallow concavity along sharksmouth and very little constriction at antennae. Clypellus slightly enlarged near apex. Face in lateral view strongly concave between anterior margin of eyes. Forewing with vein-like marks in brachial cell, about nine recurved veins to costa and extra veins in clavus.

Genitalia: Valve almost as long as greatest width, posterior margin definitely convex on each side of bluntly pointed apex; anterior margin concave on each side of truncate lobe on median third. Paraphyses slender, a complete coil on outer half; apices sharp. Aedeagus in lateral view with slender, slightly curved shaft. Styles almost four times as long as basal width, sinuate near middle, lobe on dorsal margin before finger-like process on apical fourth.

Last ventral segment of female almost twice as wide as length at middle, lateral margins convex and slightly convergent; posterior margin notched on each side of distinct, rounded lobe on median fourth.

Types: Lectotype ♂, lectoallotype ♀, Battle Point, Virginia, June 22, 1918, Sanders, here designated, in the DeLong Collection Ohio State University, Columbus, Ohio.

Material Studied: (Florida) Jacksonville, Sanford, La Belle, Branford, Suwanee Spgs. and Ft. Mead. (Georgia) Okefenokee Swamp and Prattsburg. (Alabama) Prattsville. (Louisiana) Natchitoches Parish. (Tennessee) Clarksville. (South Carolina) Florence and McClellansville. (North Carolina) Rocky Point and Wilmington. (D. C.) Washington.

Comparative Notes: This reddish species with the very sharp, slender crown is quite distinctive. Most like *argutus* in color, it has a much more pointed crown.

59. *Scaphytopius (Cloanthanus) cinereus* (Osborn and Ball)

Platymetopius cinereus, Osborn and Ball, Proc. Iowa Acad. Sci., IV: p. 193, 1897.

Platymoideus oviedus, Ball, E. D., Can. Ent., LXIII: p. 227, 1931.

Platymetopius parvus, Lathrop, Ohio Jour. Sci., XVII: p. 122, 1917.

Resembles *acutus* but smaller, yellowish in color and markings of forewing consisting primarily of dots. Length: female 4.5 mm., male 4 mm.

Color: Crown yellowish with dark fulvous irrorations throughout, light markings indicated as follows: wedge, broken oblique lines from anterior margin to base next median suture and two pairs of dots on posterior margin, one next each eye and another on each side of median suture. Pronotum more darkly marked than crown, excepting distinct light vittae. Scutellum yellow with typical markings. Clypeus, clypellus and lorae yellow, excepting long sharksmouth, lighter; dark irrorations across clypeus between eyes. Genae irrorate with dark, lightest along margin of clypeus, vitta behind eye and shorter ones near ocellus and antenna, distinct. Forewing semihyaline white with a faint fulvous tinge, numerous dark dots throughout; veins darkening posteriorly.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, anterior margin almost straight on each side of pointed apex; wedge almost half length of crown. Pronotum about two-thirds as long as crown, two and one-half times as wide as length at middle and four times length behind eye. Clypeus slightly more than twice as long as width at ocelli, slightly constricted near antennae; shallow concavity along sharksmouth. Clypellus distinctly widest near apex. Forewing with vein-like marks in brachial cell, eight or nine recurved veins to costa and usually extra cross-veins in clavus.

Genitalia: Valve about as long as greatest width, posterior margin slightly convex and converging to a rounded apex; anterior margin concave on each side of rounded lobe on median third.

Paraphyses slender, coiled around aedeagus on outer half; apices very sharp. Aedeagus with wedge-shaped base, shaft in lateral view, broad, curved and bluntly pointed. Styles about three times basal width, sinuate near middle, dorsal margin lobed just before short, bluntly pointed, finger-like, apical process.

Last ventral segment of female one and two-thirds as wide as length at middle, lateral margins convex; posterior margin with small lobe on each side of median notch.

Types: Lectotype ♂, Ames, Iowa, June 4, 1896, in the Iowa State College collection, Ames, Iowa. Lectoallotype ♀, same data, here designated. These were on hand for study.

The types of *oviedus* are in the National Museum, Washington, D. C.

The types of *parvus* were destroyed in the Clemson College fire, but a paratype male was in the Osborn Collection, and DeLong has designated an allotype from his collection.

Material Studied: Many specimens from throughout the East from Texas to Minnesota eastward. This is probably the commonest grass species in this area.

Host Plants: Ball (1932) writes "Attention was called in the original description to the fact that this species is only found in open grasslands and it was, therefore, inferred that it was a grass feeding species. With the present knowledge of food habits of the group it appears more likely that the food plant will prove to be some one of the shrubs or shrub-like plants that are found in such situations. *P. parvus* Lathrop is apparently a synonym of this species as he states that the male has a right-angled vertex and the female is 4 mm. long with orange on scutellum, characters that apply to *cinereus* but not to what he described as *cinereus* in his South Carolina list.

"*P. oviedus* Ball. This species either has several host plants on which it is apparently equally at home or else several species, for which distinctive characters have not been discovered, are involved. The type material was taken along with the nymphs on a low mat forming heather—but either this or a closely allied species is abundant, both nymphs and adults, on a wire-stemmed Euphorbiaceae (*Chamaesyce* sp.) that forms large red mats in dry places and again on a finely branching aster-like plant abundant along the margins of wet places in Florida. *P. cinereus* of Lathrop's South Carolina list is no doubt this species as it is described as too small and too long-headed in the male for the true *cinereus* Osb. & Ball."

Fletcher (1930) writes "Grass in low places in old fields. Also grass in pine woods, Beaumont, Texas. Native grassland. Throughout year."

Osborn writes, "It appears to develop especially on three different kinds of grasses, *Andropogon scoparius*, Michx., *Bouteloua hirsuta* Lag. and *curtipendula* (Michx.) Torr., the latter two species probably being its most common hosts."

Comparative Notes: Ball separates *oviedus* from *cinereus* by size and the presence of orange on the scutellum of *cinereus* but there was much gradation in size, and color of scutellum did not necessarily hold true. As one examined a series, it was found that the ones in Florida are the smallest and those further north the largest, just as the case in some other species, especially *frontalis*.

60. *Scaphytopius (Cloanthanus) guterranus* (Ball)

Platymoideus guterranus, Ball, E. D., Can. Ent., LXIII: p. 226, 1931.

Resembling *acutus* but smaller and with numerous irrorations on crown. Length: female 4.5 mm., male 4 mm.

Color: Crown mottled fuscous and light, excepting light markings as follows: wedge, broken oblique line from anterior margin halfway between eye and wedge to posterior margin on each side of median suture; on posterior margin two pairs of spots, one next each eye and one on each side of median suture. Pronotum same color as crown, vittae irregular, but usually present. Scutellum fulvous to orange with typical markings present. Clypeus ivory to light fulvous, dark irrorations between anterior margin of eyes excepting white sharksmouth. Clypellus and lorae about same color as clypeus, usually some irregular dark clouded areas; apex of clypellus darkened. Genae darker than clypeus, somewhat mottled, vitta behind eye and shorter ones near ocellus and antenna, distinct. Forewing semihyaline light fulvous with lighter aeroles, although often fulvous areas are reduced and most of wing is light; dark irrorations throughout; veins brown, becoming fuscous at apex and on costa.

Structural Characteristics: Crown one and one-half times as long as width between eyes in male, longer in female; anterior margin almost straight on each side of pointed apex; wedge about one-third length of crown. Pronotum about two-thirds as long as crown in male, half as long as crown in female, slightly over twice as wide as length at middle and three times length behind eye. Clypeus about two and one-half times as long as width at ocelli, shallow concavity

along sharksmouth, slightly sinuate at antennae. Clypellus enlarged near apex. Face in lateral view slightly concave between eyes. Forewing with several vein-like marks in brachial cell and eight or nine recurved veins to costa.

Genitalia: Valve about as long as greatest width, posterior margin distinctly convex on each side of a truncate lobe on median third. Plates slender. Paraphysis slender, extending slightly beyond apex of plates, apex pointed. Aedeagus in lateral view very short, slightly curved and parallel-margined. Styles about four times as long as basal width, almost parallel-margined to rounded outer margin before sharply pointed apical process.

Last ventral segment of female about twice as wide as length at middle, lateral margins slightly convergent, posterior margin rounded to a very small median notch.

Types: Holotype ♀, allotype ♂, Yarnell Hts., Ariz., Oct. 8, 1929, E. D. Ball, in National Museum, Washington, D. C. One pair of paratypes, same data, on hand for study.

Additional Material Studied: (Utah) Smithsfield. (Arizona) Coconino Co., Flagstaff, Sunset Pk., Yarnell, Yavapai Co., Navajo Co., St. Johns, Grand Canyon, Williams, Ashfork, Granite Dell, Kaibab and Safford. (New Mexico) Tijique, Mountain Park, Santa Fe, Las Vegas, Silver City and Jemez Spgs.

Host Plants: Ball (1932) writes "Nymphs and adults of this species were found in abundance on *Gutierrezia californica* in northern Arizona."

Comparative Notes: The relatively long crown, almost entirely covered with vermiculations, resembles no other species with the possible exception of the much larger *trilineatus*.

61. *Scaphytopius (Cloanthanus) acutus* (Say)

Jassus acutus, Say, Jour. Acad. Nat. Sci. of Phil., VI: p. 306, 1931.

Jassus modestus, Of. Vet. Akad. Forh., XI: p. 255, 1854.

Platymetopius acutus var. *dubius*, Van Duzee, E. P., Ann. Ent. Soc. Amer., III: p. 220, 1910.

Cloanthanus filamentus, DeLong, D. M., Ohio Jour. Sci., XLV: p. 22, 1945.

Cloanthanus tenuis, DeLong, D. M., Ohio Jour. Sci., XLV: p. 22, 1945.

Resembles *latus* but with different pattern on a shorter crown and with genital paraphyses almost parallel-margined. Length: female 5.2 mm., male 4.8 mm.

Color: Crown mottled fulvous with light markings as follows: thin, broken line along anterior margin; wedge; arcuate or straight line on disc from near apex to base on each side of median suture;

two pairs of dots along posterior margin, one next each eye and another next median suture, the latter are often united. Pronotum darker than crown, lightest along anterior margin, few irrorations, vittae evident. Scutellum yellow to orange with typical light markings. Clypeus, clypellus and lorae bright yellow excepting brown irrorations on both sides of yellow sharksmouth and black line along apex of clypellus. Genae fuscous except for broad area next clypeus, vitta behind eye and shorter one near ocellus. Forewing semi-hyaline fulvous with fuscous dots and vermiculations, excepting milky aeroles throughout; veins brown, becoming fuscous to black at apex and on costa.

Structural Characteristics: Crown slightly over one and one-half times as long as width between eyes, slightly convex on each side of bluntly pointed apex; wedge about one-third length of crown. Pronotum slightly shorter than crown, about two and one-fourth times as wide as length at middle, and three and one-half times length behind eyes. Clypeus about twice as long as width at ocelli, slightly constricted at antennae. Clypellus enlarged near apex. Forewings with vein-like marks in brachial cell and eight or nine recurved veins to costa.

Genitalia: Valve about one and one-fourth as wide as length at middle, posterior margin convex near bluntly pointed apex; anterior margin rounded. Paraphyses with basal bulb-like enlargement, slightly enlarged on outer half before sharp apices. Aedeagus "J"-shaped, narrowest on outer third before bluntly pointed apex. Valves long, about four times as long as basal width, slightly sinuate near basal third, slightly lobed on outer margin with a sharply pointed process on apical fifth; a small process on outer margin just before apical process. Pygofer with broad concavity on outer margin on basal half.

Last ventral segment of female one and three-fifths as wide as length at middle, lateral margins slightly convergent, posterior margin slightly convex with a slight median notch.

Types: Evidently the Say types of this species have been lost or destroyed. DeLong (1945) erected a neotype, which is in his collection.

Host Plants: DeLong (1923) writes "may be found on *Calamagrostis canadensis* in a wet meadow habitat." Lowry (1933) reports "grasses and sedges" as the hosts. Osborn (1915) writes "—from bushes, grass and sweet fern—willows, potato and various plants." This species is apparently found on a large number of hosts.

Comparative Notes: This species is the most variable one in the genus, both in external characters and internal genitalia. Color may vary from almost black to a light fulvous, the crown may vary considerably in length, and the lorae may vary from almost black to fulvous. The styles vary from long to rather short. The only constant character is the broadly concave margin of the pygofer on basal half, often the only character that will separate this species from similar ones. Several attempts were made to separate this species into subspecies, but there are gradations from one extreme to the other. Until more is known regarding the host relationships, it is best to consider them as one species, especially with the good character furnished by the outer margin of the pygofer.

62. *Scaphytopius (Cloanthanus) oregonensis* (Baker)

Platymetopius oregonensis, Baker, Can. Ent., XXXII: p. 49, 1900.

Resembling *acutus* but larger, lighter in color, margins of face not infuscated and with shorter crown. Length: female 6 mm., male 5.5 mm.

Color: Crown fulvous with brown irrorations, light markings, as follows: thin line along anterior margin, wedge, indistinct, irregular arcuate line on each side of median suture on disc. Pronotum about same color as crown but with few or no irrorations, vittae usually evident only on lateral margins. Scutellum slightly darker than crown with typical light markings. Clypeus, clypellus and lorae ivory to yellow, excepting distinct long sharksmouth and dark dots between this and posterior margin. Genae fulvous, darkest on lateral margins, vitta behind eye and shorter one near ocellus distinct. Forewings semihyaline fulvous with milky aeroles throughout, especially on costa; veins concolorous near base, becoming brown to fuscous at apex and on costa.

Structural Characteristics: Crown of male about one and one-third times width between eyes, longer in female, anterior margin straight to slightly convex on each side of pointed apex; wedge almost half length of crown. Pronotum about two-thirds as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eyes. Clypeus slightly over twice as long as width at ocelli, only slightly constricted at ocelli, shallow concavity along sharksmouth. Clypellus slender, only slightly enlarged near apex. Face in lateral view straight in male, slightly concave between antennae in female. Forewings with

several vein-like markings in brachial cell, about nine recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve slightly wider than length at middle, roughly triangular, posterior margin almost straight on each side of bluntly pointed apex; anterior margin with short, broad, median lobe. Paraphyses stout, broadest near outer fourth before sharp apices. Aedeagus in lateral view narrowest at base, broadest near middle; apex bluntly pointed. Styles short, about two and one-half times as long as basal width, sinuate just before middle, lobed on outer margin before sharply pointed process on apical fifth.

Last ventral segment of female almost as long as basal width, lateral margins somewhat converging, posterior margin rounded.

Types: Dr. P. W. Oman writes regarding the type of this species, "Oreg. 2509 Collection Carl F. Baker. Associated notes indicate that this specimen was collected at Portland, Ore., 9-18-97, A. P. Morse." This male specimen in National Museum, Washington, D. C. Allotype female, Canyonville, Ore., July 12, 1935, R. H. Beamer, here designated, in the Snow Entomological Collections. Parallotype ♀ ♀, as follows: (California) 3, Santa Cruz Mts., Aug. 13, 1938, R. I. Sailer; 1, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer; 10, Santa Rosa, Aug. 16, 1938, R. H. Beamer; 1, Santa Rosa, Aug. 16, 1938, D. W. Craik; 4, Santa Rosa, Aug. 16, 1938, L. W. Hepner; 5, Jamesburg, Aug. 11, 1938, R. H. Beamer; 4, Jamesburg, Aug. 11, 1938, L. W. Hepner; 2, Jamesburg, Aug. 11, 1938, R. I. Sailer; 5, Lockwood, July 24, 1935, R. H. Beamer; 3, Dunsmuir, June 29, 1935, R. H. Beamer; 1, Dunsmuir, Aug. 13, 1912, E. D. Ball; 1, Dunsmuir, June 28, 1935, P. W. Oman; 3, Towie, Aug. 20, 1938, R. H. Beamer; 2, Towie, Aug. 20, 1938, R. I. Sailer; 3, Lompoc, Aug. 7, 1938, R. I. Sailer; 1, Occidental, Aug. 16, 1938, R. H. Beamer; 1, Niles, July 15, 1933, R. H. Beamer and 1, Redding, June 29, 1933, P. W. Oman. (Oregon) 7, Le Grand, Aug. 29, 1909, E. D. Ball; 1, Le Grand, July 16, 1921, E. W. Davis; 2, Medford, Aug. 14, 1912, E. D. Ball and 1, Ashland, Aug. 13, 1912, E. D. Ball. (Washington) 6, Wenatchee, Aug. 18, 1912, E. D. Ball. (Idaho) 2, Moscow Mt., Sept. 15, 3, Sept. 18 and 1, Sept. 24, J. Gillette. (Utah) 2, Logan Canyon, Sept. 9, 1934, T. O. Thatcher; 3, Logan Canyon, Aug. 21, 1934, Smith and Thatcher and 1, Logan Canyon, July 31, 1933, G. F. Knowlton. (Montana) 1, Missoula, Aug. 11, 1931, R. H. Beamer. (British Columbia) 1, Vernon, Aug. 5, 1931, R. H. Beamer.

Host Plants: Specimens were examined with the following host data on them: *Arctostaphyleae manzanita*, Occidental, Calif.; *A.*

patula, Towie, Calif.; *Holodiscos discolor*, *Medicago sativa*, *Ceanothus sanguineus* and *Pteridium aquilium*, Moscow Mts., Idaho, and buck brush, Logan Canyon, Utah. Ball (1932) writes "—was swept by the writer both larvae and adults in abundance from mixed clumps of wild roses and snowberries (*Symphoricarpos*) at Wenatchee and Le Grand, Oregon."

Comparative Notes: There is a light *acutus* in the same range with *oregonensis* but the latter species has a shorter crown, is larger and lacks the concavity on the outer margin of the male pygofer. The males are sometimes quite dark and are almost invariably darker than females.

63. *Scaphytopius (Cloanthanus) latus* (Baker)

Platymetopius latus, Baker, Can. Ent. XXXII: p. 50, 1900.

Platymetopius cuprescens, Osborn, Report of N. Y. St. Entomologist, p. 517, 1905.

Resembles *acutus* but with less distinct markings on a longer crown, lighter on margins of genae, shorter male plates and longer last ventral segment of the female. Length: female 5.5 mm., male 5 mm.

Color: Crown fulvous, darkest on disc with light wedge and sometimes faintly evident, long arcuate marks on disc. Pronotum about same color as disc of crown, lightest along anterior margin. Scutellum fulvous, darkest next each basal corner, typical markings distinct. Face yellow to fulvous, darkest on lateral margin and along base of clypeus; long sharksmouth faint but distinct. Forewing fulvous on clavus, darker on corium, dark vermiculations on corium, light aeroles near apex, darkest on outer anteapical; veins fulvous, becoming brown to fuscous at apex and on costa.

Structural Characteristics: Crown about twice as long as width between eyes, somewhat concave on disc, straight on each side of rounded, but acutely pointed apex; wedge about one-third length of crown. Pronotum slightly more than twice as wide as length at middle, three and one-half times length behind eyes. Clypeus about two and one-fourth times width at ocelli, only slightly constricted at antennae; shallow concavity along sharksmouth. Clypellus relatively broad and slightly enlarged near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewing with numerous vein-like marks in brachial cell, about twelve recurved veins to costa and usually extra cross-veins in clavus.

Genitalia: Valve about one and one-third as wide as length at middle, posterior margin oval; anterior margin with relatively large,

truncate, median lobe. Paraphyses stout, bulb-like, basal area elongate, greatly enlarged on outer fifth; spine-like process at apices. Aedeagus in ventral view narrowest on outer half. Styles stout, two and one-half times as long as basal width, sinuate near basal third, lobed on outer margin before stout, bluntly-pointed process on apical third.

Last ventral segment of female about one and one-third as wide as length at middle, lateral margins converging, posterior margin with broad lobe on each side of small median notch.

Types: Holotype ♀, "Colo. 882, Collection Carl F. Baker, Collected Ft. Collins, Colo., 8-11." in the National Museum, Washington, D. C. Allotype ♂, here designated, "Colo." (only data) in Snow Entomological Collections. Parallotype ♂♂ as follows: (Utah) 1, Ogden, July 24, 1912. (North Dakota) 1, Lake Metigoshe, July 30, 1937, R. H. Beamer. (Minnesota) 2, Fairbanks, Aug. 13, 1937, R. H. Beamer; 2, Eveleth, Aug. 12, 1937, R. H. Beamer; 1, St. Anthony Peak, June 28, 1910, "E. P." and 1, Cook Co., Aug. 21, 1938, H. T. Peters. (Wisconsin) 3, Brule, Aug. 16, 1937, R. H. Beamer; 1, Cheboygan Co., July 16, 1936, M. W. Sanderson; 1, Cheboygan Co., July 14, 1931, H. B. Hungerford and 1, Cheboygan Co., July 11, 1933, Harold Peters. (New Hampshire) 1, Notchland, Aug. 20, 1934, R. H. Beamer. (Canada) 2, Newaygo, July 30, 1929, Parrish. (Manitoba) 1, Russell, Aug. 1, 1937, R. H. Beamer; 2, Birch River, Aug. 3, 1937, R. H. Beamer and 1, Mafeking, Aug. 3, 1937, R. H. Beamer.

Host Plants: Material examined from Itasca Park, Minnesota, were collected on *Pinus banksiana*.

Comparative Notes: This species is apparently rare in Colorado and Utah, but is rather common in the Northeast and has been known as *cuprescens* Osborn.

64. *Scaphytopius (Cloanthanus) argutus* De Long

Cloanthanus argutus, DeLong, D. M., Ohio Jour. Sci., XLV: p. 24, 1945.

Scaphytopius hastus, DeLong, D. M., Ohio Jour. Sci., XLV: p. 24, 1945.

Scaphytopius lanceus, DeLong, D. M., Ohio Jour. Sci., XLV: p. 24, 1945.

Resembling *acutus* but lighter along margins of genae, darker outer wings, and paraphyses enlarged near apex. Length: female 5 mm., male 4.5 mm.

Color: Crown fulvous, sometimes darkest on disc with light markings as follows: thin line along anterior margin, wedge, long arcuate vitta on each side of median suture and usually two pairs of large dots along posterior margin. Pronotum usually darker than

crown, typical vittae usually faintly indicated. Scutellum about same color as crown, with typical markings. Clypeus, elyellus and lorae yellow to fulvous, darkest along posterior margin excepting long sharksmouth. Genae darker than clypeus, lightest next clypeus, and vitta behind eye and near ocellus distinct. Forewing opaque fulvous to reddish-fulvous with white aerole at apex of clavus and apex of corium, dark vermiculations; veins fuscous.

Genitalia: Valve about one and one-fourth times as wide as length at middle, posterior margin rounded to bluntly pointed apex; anterior margin concave on each side of broad, rounded lobe on median third. Paraphyses extending well beyond plates and, except for basal bulb, almost parallel-margined to outer fourth, where they are enlarged, long, plate-like, before sharp apices. Aedeagus in ventral view, much narrower near apex, in lateral view with short, broad "arrow head"—like basal process and slightly curved shaft, narrowed to a blunt apex. Styles about three times as long as basal width, sinuate near middle, long lobe on dorsal margin just before finger-like apical process.

Types: Types of *argutus* and *lanceus* in the DeLong collection, Ohio State University, Columbus, Ohio. Types of *hastus* in Illinois Natural History Survey collection, Urbana, Illinois. Holotype of *argutus*, and paratypes of *lanceus* and *hastus* on hand for study.

Additional Material Studied: (Florida) Hilliard. (Georgia) Prattsburg and Griffin. (Alabama) Burnsville and Tuskegee. (Mississippi) Fulton, Ireland, and Shuqulak. (Louisiana) Caddo Parish. (South Carolina) Tigerville and Lexington. (Tennessee) Clarksville, Magnolia, Coal Creek, Elk Valley and Chattanooga. (North Carolina) Walnut. (Kentucky) Cadiz. (Arkansas) Polk Co. (Indiana) Gary.

Host Plants: The host plant is not known.

Comparative Notes: This species varies a great deal in size, color and with some variation in the male genitalia. The distinctive characters are the brownish, almost opaque wings, the fulvous face and the aedeagus much smaller at apex than at middle, when viewed from ventral side. Sometimes the crown is lighter than forewings.

65. *Scaphytopius (Cloanthanus) fuscicephalus* Hepner

Scaphytopius (Cloanthanus) fuscicephalus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX, p. 105, 1946.

Resembles *argutus* but with crown darkest on disc and aedeagus straight and parallel-margined in ventral view. Length: female 4.8 mm., male 4.1 mm.

Color: Crown mottled fulvous and brown, darkest on disc; wedge light. Pronotum fulvous flecked with dark, vittae evident. Scutellum dark fulvous, darkest near basal corner, typical markings present. Face yellowish, slightly darker behind eyes and along basal margin between ocelli, with dark-margined light markings as follows: sharksmouth, vitta behind eye and shorter one near ocellus. Forewings translucent brown, veins and many vermiculations, darker; white aeroles throughout.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin almost straight on each side of sharply pointed apex; wedge about two-fifths length of crown. Pronotum about three-fifths as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus slightly more than twice as long as width at ocelli, only slightly, if any, sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewings often with extra veins in clavus, vein-like markings in brachial cell and about ten recurved veins to costa.

Genitalia: Valve about three-fourths as long as greatest width, posterior margin bell-shaped; anterior margin with broad, short, median lobe. Paraphyses long, slender and only slightly enlarged near apices. Aedeagus in ventral view parallel margined; in lateral view slightly curved near base. Styles about two and one-half times as long as basal width, sinuate near middle, lobed on outer margin before finger-like process on apical third.

Last ventral segment of female almost twice as wide as median length, latero-posterior margin rounded.

Types: Holotype ♂, allotype ♀, Lawrence, Kansas, Sept. 4, 1941, L. W. Hepner, in the Snow Entomological Collections. Paratypes as follows: (Kansas) 1 ♂, Cherokee Co., Apr. 9, 1938, R. H. Beamer; 1 ♂, Coffeyville, June 15, 1939, 1 ♂, June 24, 1939, and 1 ♂, July 16, 1939, L. W. Hepner; 1 ♀, Douglas Co., July, 1926, E. L. Bales; 1 ♂, Douglas Co., Aug. 28, 1928, 1 ♂, Aug. 17, 1928 and 1 ♂, June 21, 1928, P. B. Lawson; 4 ♀♀, Atchison Co., July 8, 1924, E. P. Breakey.

Host Plants: The host plant is not known.

Comparative Notes: Specimens were on hand from Texas and New Mexico which were evidently of this species. It is separated from *argutus* by the different aedeagus and much darker crown.

66. *Scaphytopius (Cloanthanus) viridicephalus* Hepner

Scaphytopius (Cloanthanus) viridicephalus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 105, 1946.

Resembling *slossonae* but with shorter, greenish crown, and darker male. Length: female 4.2 mm., male 3.6 mm.

Color: Crown greenish-fulvous, especially in female, with wedge, long arcuate markings on disc and two pairs of large dots on posterior margin at least indicated. The male often is only faintly tinged with green, but may be distinguished from other species by the crown being much lighter than the forewing. Pronotum darker than crown, sparsely punctate with dark in the male, vittae distinct. Scutellum about same color as pronotum with typical light markings present. Face greenish-fulvous in female, light green in male, slightly darkest along lateral margin of genae, long sharksmouth, vitta behind eye and another near ocellus faintly indicated. Forewing of male semihyaline fulvous with dark vermiculations throughout, very dark on apex, veins concolorous at base, darkening and becoming fuscous at apex and on costa. Forewing of female bright fulvous throughout, a few milky aeroles throughout, no vermiculations; veins concolorous. Occasionally a female with one or two recurved veins darkened will be found.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin straight on each side of pointed apex; wedge over one-third length of crown. Pronotum about three-fifths as long as crown, two and one-half times as wide as length at middle and four and one-half times length behind eye. Clypeus about two and one-fourth times width at ocelli, only slightly constricted at antennae. Clypellus definitely enlarged near apex. Face in lateral view almost straight. Forewing with about seven recurved veins to costa, claval veins approaching each other at cross vein and sometimes extra cross veins in clavus.

Genitalia: Valve about one and one-fourth as wide as length at middle, posterior margin convex on each side of bluntly pointed apex; anterior margin slightly concave on each side of median lobe. Paraphyses with basal, bulb-like enlargement, almost parallel-margined to enlargement near sharp apices. Aedeagus in lateral view, slightly curved, smallest near blunt apex. Styles stout, about three times as long as basal width, sinuate just before middle, lobed on dorsal margin before finger-like process on apical third.

Last ventral segment of female about twice as wide as length at middle, latero-posterior margin rounded to a small median lobe.

Types: Holotype ♂, allotype ♀ and 4 ♂ and 8 ♀ paratypes, Shuqualak, Mississippi, July 16, 1930, P. W. Oman, in the Snow Entomological Collections. Additional paratypes as follows: (Mississippi) 2 ♂ ♂, Shuqualak, July 16, 1930, R. H. Beamer; 1 ♀, Shuqualak, July 16, 1930, L. D. Tuthill; 1 ♀, Meridian, July 17, 1930, L. D. Tuthill; 1 ♀, Hamilton, July 15, 1930, R. H. Beamer; 1 ♀, Fulton, July 14, 1930, R. H. Beamer and 1 ♂, Columbus, July 16, 1930, R. H. Beamer. (Alabama) 1 ♀, Marion Jct., July 16, 1930, R. H. Beamer. (Texas) 2 ♂ ♂, Brownsville, Dec. 27, 1945, and 2 ♀ ♀, June 29, 1938, R. H. Beamer; 8 ♀ ♀, 1 ♂, Brownsville, May 25, 1939, and 1 pr., Aug. 8, 1937, D. J. and J. N. Knull; 11 ♀ ♀, 8 ♂ ♂, Brownsville, May 31, 1933, and 19 ♀ ♀, 24 ♂ ♂, May 29, 1933, P. W. Oman and 2 ♀ ♀, Benchley, April 30, 1941, D. J. and J. N. Knull.

Host Plants: The host plant is not known.

Comparative Notes: In some of the series, some specimens have a distinctively green head, while others will hardly be green at all, but a dark fulvous in the male, lighter in the female.

67. *Scaphytopius (Cloanthanus) utahensis* Hepner

Scaphytopius (Cloanthanus) utahensis, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: 107, 1946.

Resembling *graneticus* but larger, somewhat lighter in color, with broader aedeagus and paraphyses. Length: female 5 mm., male 4.8 mm.

Color: Crown fulvous flecked with brown, darkest next median suture, except for light markings as follows: line along anterior margin, wedge, long arcuate line on disc on each side of median suture. Pronotum fulvous flecked with dark, vittae irregular but present. Scutellum fulvous with a few irregular brown markings on basal half and a large brown spot inside each basal corner. Face light fulvous to yellow, with fuscous-bordered light markings as follows: sharksmouth, vitta behind eye and a shorter one in front of eye near ocellus. Forewing semihyaline fulvous with veins and many vermiculations, brown.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin almost straight on each side of apex. Pronotum about two-thirds as long as crown, two and one-fourth times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-third times as long as width at ocelli, lateral margins slightly sinuate at antennae. Clypellus

slender, only slightly enlarged near apex. Face in lateral view straight. Forewing with vein-like marks in brachial cell and about twelve recurved veins to costa.

Genitalia: Valve almost as long as greatest width, posterior margin oval, anterior margin with broad, short, truncate lobé. Paraphyses slender on basal three-fifths, gradually enlarged almost to sharp apices. Aedeagus in ventral view almost parallel-margined; in lateral view, long, curved near base, almost parallel-margined to blunt apex. Styles almost four times as long as basal width, sinuate near middle, lobed on outer margin before short, slender finger-like apical process.

Last ventral segment of female about one and one-half times as wide as median length, latero-posterior margin rounded, slightly notched at middle.

Types: Holotype ♂, allotype ♀, and 4 ♀ and 1 ♂ paratypes, Alton, Utah, Aug. 11, 1936, R. H. Beamer, in the Snow Entomological Collections.

Host Plants: The type series was collected on *Rhus* sp.

Comparative Notes: This species is a tannish color and rather more slender than related species.

68. *Scaphytopius (Cloanthanus) graneticus* (Ball)

Platymoideus graneticus, Ball, E. D., Can. Ent., LXIII: p. 226, 1931.

Resembling *acutus* but smaller, with lateral margins of genae lighter and pygofer without basal concavity on outer margin. Length: female 4.8 mm., male 4.3 mm.

Color: Crown mottled fulvous and brown, often darkest on disc; light markings as follows: thin, sometimes broken line along anterior margin, wedge, long arcuate vitta on disc on each side of median suture and usually four large dots on posterior margin. Pronotum about same color as crown, darkest on disc, typical light vittae at least indicated. Scutellum yellow to orange with typical light markings. Clypeus, clypellus and lorae yellow, excepting brown markings around long sharksmouth and along posterior margin between eyes. Genae yellow next clypeus, darkening and becoming fulvous on lateral margins; vitta behind eye and near ocellus, distinct. Forewing semihyaline fulvous with many brown vermiculations, especially in male; veins darkening posteriorly, becoming black on costa.

Structural Characteristics: Crown about twice as long as width

between eyes in female, shorter in male, anterior margin straight on each side of sharp apex; wedge over one-third length of crown. Pronotum about two-thirds as long as crown; two and one-third times as wide as length at middle and about three and one-half times length behind eyes. Clypeus about two and one-half times width at ocelli, constricted at antennae, concave along sharksmouth. Clypellus relatively slender and somewhat enlarged near apex. Face in lateral view straight to slightly concave between anterior margin of eyes. Forewings with several vein-like markings in brachial cell, about ten recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about one and one-third times as wide as length at middle, posterior margin convex on each side of rounded apex; anterior margin rounded. Paraphyses slender, with relatively small basal, bulb-like enlargement; enlarged on apical fourth before sharp apex. Aedeagus in lateral view, slender, slightly larger and curved on basal half. Styles about three times as long as basal width, sinuate near middle, lobe on outer margin before slender, finger-like process on apical fifth.

Last ventral segment of female about one and two-thirds as wide as length at middle, latero-posterior margin evenly oval.

Types: Holotype ♀, Granite Dell, Ariz., July 17, 1929, allotype ♂, Williams, Arizona, Aug. 15, 1929, E. D. Ball, in the National Museum, Washington, D. C. One pair of paratypes, same data as holotype, on hand for study.

Additional Material Studied: (Arizona) Prescott, Yavapai Co., Granite Dell, Oak Creek Canyon and Kaibab Forest. (California) Leona Hts., Alameda Co., Lemon Cove, Redding, Delta, Big Bear Lake, Dunsmuir, Mint Canyon, Santa Rosa, Atascadero, Alpine and Stinton Beach.

Host Plants: Ball (1932) writes "Females of this species were taken in some numbers from wild grapes near Prescott, Arizona, July 17. It was apparently the last end of a brood as there were no nymphs or males present at that time. A single male was taken from wild grapes in the mountains above Williams, Arizona, Aug. 15."

Comparative Notes: This species is somewhat like *argutus* from the East, but the genitalia are somewhat different. It varies considerably, the specimens from California being much darker than those from Arizona.

69. *Scaphytopius (Cloanthanus) canus* Hepner

Scaphytopius (Cloanthanus) canus, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 107, 1946.

Resembling *trilineatus* but larger, lighter in color, with a light face and genital paraphyses much larger near apex. Length: female 6 mm., male 5.6 mm.

Color: Crown light fulvous with brown irrorations, light markings as follows: line along anterior margin, wedge, irregular arcuate line on disc on each side of median suture and an indication of another line parallel to this just inside eyes. Pronotum usually slightly darker than crown, darkest on disc and sparsely sprinkled with brown dots; vittae usually evident only on lateral margins. Scutellum about same color as crown with typical markings. Clypeus, clypellus and lorae light fulvous, except for sharksmouth and irregular brown markings along base of clypeus; apex of clypellus brown. Forewings light fulvous with brown dots throughout; veins fulvous, becoming fuscous on costa.

Structural Characteristics: Crown about twice as long as width between eyes in male, slightly longer in female, anterior margin almost straight on each side of slender, but bluntly pointed apex; wedge almost half length of crown. Pronotum slightly over half length of crown, about two and one-half times length behind eyes. Clypeus almost two and one-half times width at ocelli, slightly sinuate at antennae; shallow concavity along sharksmouth. Clypellus stout, slightly enlarged near apex. Face in lateral view slightly concave between anterior margin of eyes. Forewings with many vein-like marks in brachial cell, about twelve recurved veins to costa and often extra veins in clavus.

Genitalia: Valve about three-fourths as long as greatest width, posterior margin straight on each side of bluntly pointed apex, anterior margin convex. Paraphyses enlarged near sharp apices. Aedeagus "J"-shaped, almost parallel-margined throughout. Styles over twice as long as basal width, sinuate near middle, distinct lobe on outer margin before rather small apical process.

Last ventral segment of female about three-fourths as long as greatest width, convex and converging on lateral margins; posterior margin straight.

Types: Holotype ♂, allotype ♀, 10 ♀ and 11 ♂ paratypes, Pine Valley, California, July 27, 1938, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Cali-

fornia) 2 ♀ ♀, Quatay, July 19, 1941, R. H. Beamer; 1 ♀, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer.

Host Plants: The type series was collected on *Garrya veatchii* which is probably the host plant.

Comparative Notes: This species resembles *trilineatus*, but has a shorter crown and the face is light. The general color is much lighter than *trilineatus*. It is evidently restricted to southern California.

70. *Scaphytopius (Cloanthanus) trilineatus* (Ball)

Platymetopius trilineatus, Ball, E. D., Ent. News, XXVII: p. 204, 1916.

Platymetopius pezatus, Van Duzee, E. P., Proc. Calif. Acad. Sci., XLI: p. 415, 1925.

Resembles *acutus*, but with longer crown, dark face and distinct genitalia. Length: female 5.2 mm., male 5 mm.

Color: Crown mottled brown or fuscous and ivory, with light areas as follows: relatively broad line along anterior margin; wedge; irregular arcuate line from near apex to base on each side of median suture; two pairs of large dots on posterior margin, one next each eye and another on each side of median suture, often continuous with the long arcuate vittae on disc. Pronotum about the same color as crown with vittae fairly distinct. Scutellum fulvous to brown with typical markings. Face brown to reddish-brown with small light dots throughout, lightest on long sharksmouth and coarse vermiculations along base between eyes; darkest on lateral margin of genae; vitta behind eye and shorter ones near ocellus and antenna distinct. Forewing opaque fulvous on disc, apex and part of clavus, remainder semihyaline white in patches, scattered vermiculations throughout; veins dark.

Structural Characteristics: Crown almost two and one-half times as long as width between eyes, anterior margin almost straight on each side of sharp apex; disc somewhat concave; wedge over half length of crown. Pronotum slightly less than half as long as crown, two and one-third times as wide as length at middle and four times length behind eyes. Clypeus over two and one-half times as long as width at ocelli, definitely constricted at antennae; concavity along sharksmouth. Clypellus somewhat enlarged near apex. Face in lateral view somewhat concave between anterior margin of eyes. Forewings with several vein-like marks in brachial cell, about eleven recurved veins to costa and usually extra cross-veins in clavus.

Genitalia: Valve about seven-tenths as long as greatest width, posterior margin rounded; anterior margin with broad, short median

lobe. Paraphyses long, slender and hardly enlarged at all before sharp apices. Aedeagus roughly "L"-shaped, short, almost parallel-margined throughout. Styles slender, over twice as long as basal width, small lobe on outer margin before process on apical fifth.

Last ventral segment of female about three-fourths as long as greatest width, lateral margins straight and converging; posterior margin straight and converging on each side of a shallow, slender median notch.

Types: Holotype ♂, San Margareta, Calif., Aug. 6, 1912, E. D. Ball, in the National Museum, Washington, D. C. Allotype ♀ and 12 ♀ paratypes, Anza, California, July 29, 1938, R. H. Beamer, in the Snow Entomological Collections. Additional ♀ paratypes as follows: 1, Anza, July 29, 1938, R. I. Sailer; 2, Santa Rosa, Aug. 16, R. H. Beamer; 4, Santa Cruz Mts., Aug. 13, 1938, R. H. Beamer; 3, Santa Cruz Mts., Aug. 13, 1938, R. I. Sailer; 1, Lompoc, Aug. 7, 1938, R. I. Sailer; 1, Alpine, July 19, 1941, R. H. Beamer; 1, Arroyo Seco River, Aug. 8, 1938, R. H. Beamer; 1, Jacumba, July 17, 1940, R. H. Beamer; 1, Towie, Aug. 20, 1938, R. H. Beamer and 20, Boulevard, July 26, 1938, R. H. Beamer.

Host Plants: Ball (1932) writes "This California species was taken by the writer in number from *Rhus trilobata* in several places in the mountains around Prescott, Arizona." Ball was evidently referring to the subspecies *spicatus*, found in Arizona. Numerous specimens were collected in California in 1938 on *Arctostaphyleae* sp.

Comparative Notes: The dark face separates this species from *canus* and the truncate plates from *spicatus*. This species varies a great deal in color, although usually it is darker than the other two species mentioned above.

71. *Scaphytopius* (*Cloanthanus*) *trilineatus spicatus* Hepner

Scaphytopius (*Cloanthanus*) *trilineatus* subsp. *spicatus*, Hepner, L. W., Jour. Kan. Ent. Soc., XIX: p. 108, 1946.

Resembling *trilineatus* but lighter with fulvous areas of forewing restricted to apical cells and with plates sharply pointed. Length: female 5.5 mm., male 5 mm.

Color: Crown mottled ivory and fuscous with light markings as follows: thin line along anterior margin; long wedge; irregular arcuate vitta on each side of median suture from near apex to base and usually two pairs of large dots on posterior margin, one next each eye and another on each side of median suture. Pronotum

about same color as crown, lightest on anterior and lateral margins, vittae distinct. Scutellum ivory, dark irrorations and typical light markings. Face ivory with fine brown to fuscous irrorations excepting long sharksmouth and coarser irrorations along posterior margin, darkest on lateral margins of genae. Forewing semihyaline white except for small fulvous area in apical cells, fuscous vermiculations and veins throughout.

Structural Characteristics: Crown over twice as long as width between eyes in male, twice width between eyes in female, shallow concavity on disc, anterior margin straight to slightly concave on each side of pointed apex; wedge about half length of crown. Pronotum about half as long as crown, about two and one-fourth times as wide as length at middle and four times length behind eyes. Clypeus over two and one-half times as long as width at ocelli, concavity along sharksmouth, sinuate at antennae. Clypellus enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewing with several vein-like marks in brachial cell, about twelve recurved veins to costa and sometimes extra cross-veins in clavus.

Genitalia: Valve about one and one-half times as wide as length at middle, posterior margin rounded; anterior margin with broad, short, median lobe. Paraphyses with slight basal enlargement, slightly broadened just before sharp apices. Aedeagus in lateral view roughly "L"-shaped, short, almost parallel-margined throughout. Styles about two and one-half times as long as width at base, slightly sinuate just before middle, outer lobe on dorsal margin just before finger-like process on apical fifth.

Last ventral segment of female about one and one-half times as wide as length at middle, lateral margins converging; posterior margins with lobe on each side of relatively prominent median notch.

Types: Holotype ♂, allotype ♀, and 27 ♀ and 5 ♂ paratypes, Miami, Ariz., Aug. 6, 1941, R. H. Beamer, in the Snow Entomological Collections. Additional paratypes as follows: (Arizona) 1 ♀, Miami, July 22, 1932, R. H. Beamer; 7 ♀ ♀, 8 ♂ ♂, Yarnell, July 29, 1933, 4 ♀ ♀, 1 ♂, July 27, 1933, and 2 ♀ ♀, July 25, 1932, R. H. Beamer; 1 ♀, Yarnell Hts., July 2, 1929, R. H. Beamer; 1 pair, Yarnell, June 19, 1937, D. J. and J. N. Knull; 2 ♀ ♀, Yarnell Hts., June 21, 1935, 2 ♀ ♀, Oct. 8, 1929, 2 ♀ ♀, July 21, 1929, and 1 ♀, Aug. 20, 1929, E. D. Ball; 9 ♀ ♀, 6 ♂ ♂, Yarnell Hts., June 29, 1933, P. W. Oman; 1 pair Yavapai Co., July 1, 1929, and 1 ♀, Aug. 9, 1927, R. H. Beamer; 1 ♂, Granite Dell, Aug. 14, 1935, R. H.

Beamer; 1 ♀, Granite Dell, Oct. 6, 1929, and 4 ♀ ♀, July 17, 1929, E. D. Ball; 3 ♀ ♀, Prescott, July 29, 1933, R. H. Beamer; 1 ♀, Prescott, June 30, 1939, and 1 ♀, June 8, 1941, D. J. and J. N. Knull; 3 ♀ ♀, Prescott, N. F., July 6, 1937, 3 ♀ ♀, July 14, 1940, and 1 ♂, June 20, 1937, D. J. and J. N. Knull; 1 ♀, Santa Rita Mts., Aug. 18, 1935, R. H. Beamer; 1 ♀, Gila Co., Aug. 5, 1927, R. H. Beamer; 4 ♀ ♀, Hereford, Aug. 22, 1935, R. H. Beamer; 2 pairs, Huachucua Mts., July 20, 1937, D. J. and J. N. Knull; 2 ♀ ♀, Huachucua Mts., Oct. 19, 1931, E. D. Ball; 1 ♀, Oak Creek Canyon, July 13, 1940, D. J. and J. N. Knull; 1 ♀, Chiricahua Mts., Sept. 14, 1938, 1 ♀, June 15, 1939, and 1 ♂, Aug. 28, 1940, D. J. and J. N. Knull; 1 ♂, Devil's Canyon, Aug. 25, 1938, D. J. and J. N. Knull; 2 ♂ ♂, Faraway Ranch, Aug. 11, 1931, E. D. Ball; 1 ♀, Glenn Oaks, July 19, 1929, and 1 ♂, July 18, 1929, E. D. Ball. (New Mexico) 1 ♀, Silver City, Aug. 23, 1936, R. H. Beamer.

Host Plants: The specimen from Silver City was collected on Mountain Mahogany. Ball (1932) was evidently referring to this form when he gave *Rhus trilobata* as the host plant of *trilineatus*.

Comparative Notes: The males of this species can be separated from *trilineatus* by the sharp plates and the female by the absence of the notch on the last ventral segment.

72. *Scaphytopius (Cloanthanus) abbreviatus* (DeLong)

Platymctopius abbreviatus, DeLong, D. M., Tenn. St. Board of Entomology, XVII: p. 39, 1916.

Platymetopius parvus var. *niger*, DeLong, D. M., Ohio Jour. Sci., XLV: p. 27, 1945.

Color: Crown brown mottled with yellow, light markings as follows: thin line along anterior margin; wedge; indistinct arcuate line on disc on each side of median suture; typical large dots along posterior margin. Pronotum darker than crown, heavily irrorate, vittae visible. Scutellum about same color as crown, with typical markings. Face fulvous irrorate with brown, darkest on lateral margin of genae; sharksmouth, vitta behind eye and shorter ones near ocelli and at antennae, light. Forewings semihyaline fulvous with white aeroles and brown irrorations throughout; veins fuscous.

Structural Characteristics: Crown about one and one-half times as long as width between eyes, slightly concave on each side of bluntly pointed apex; wedge about one-third length of crown. Pronotum about three-fourths length of crown, two and one-third times as wide as length at middle and three and one-half times length behind eye. Clypeus about two and one-third times as

long as width at ocelli, only slightly constricted, if any, at antennae; shallow concavity along sharksmouth. Clypellus enlarged at apex. Face in lateral view definitely concave between anterior margin of eyes. Forewing with numerous vein-like marks in brachial cell, about nine recurved veins to costa and often extra cross-veins in clavus.

Genitalia: Valve about two-thirds as long as greatest width, posterior margin convex on each side of teat-like apex. Paraphyses long, slender and sharply pointed. Aedeagus in lateral view "L"-shaped, almost parallel-margined throughout. Styles almost five times as long as basal width, constricted on basal third, small lobe on outer margin before slender process on outer two-fifths.

Last ventral segment of female about two-thirds as long as greatest width, latero-posterior margin rounded.

Types: Lectotype ♀, Tullahoma, Tenn., Aug. 2, 1915, D. M. DeLong, here designated, in the DeLong Collection, Ohio State University, Columbus, Ohio. Allotype ♂, Tullahoma, Tenn., Aug. 3, 1915, D. M. DeLong, here designated, in the DeLong collection, Ohio State University, Columbus, Ohio. Additional ♂ parallotypes as follows: (Florida) 13, Sanford, July 25, 1934, R. H. Beamer; 3, Sanford, Aug. 8, 1939, R. H. Beamer; 1, Sanford, Aug. 8, 1939, A. T. Hardy; 3, Pensacola, July 12, 1934, R. H. Beamer; 1, Yankeetown, July 17, 1934, R. H. Beamer; 3, Lacoochee, Aug. 18, 1930, R. H. Beamer; 1, Branford, July 16, 1934, R. H. Beamer; 2, Branford, July 31, 1930, P. W. Oman; 1, Homestead, Aug. 9, 1930, R. H. Beamer; 1, Ft. Myers, Aug. 14, 1930, R. H. Beamer; 3, July 16, 1939, La Belle, R. H. Beamer; 1, July 16, 1939, La Belle, P. B. Lawson; 4, Suwanee Spgs., Aug. 2-3, 1939, R. H. Beamer; 1, Likely, July 24, 1934, R. H. Beamer; 1, Wildwood, Aug. 2, 1930, R. H. Beamer; 1, Hilliard, Aug. 6, 1939, R. H. Beamer and 1, Dunnellon, July 12, 1939, R. H. Beamer. (Georgia) 3, Griffin, Aug. 12, 1939, R. H. Beamer; 2, Okefenokee Swamp, Aug. 3, 1934, R. H. Beamer and 1, Folkston, Aug. 2, 1934, R. H. Beamer. (Alabama) 1, Burnsville, July 20, 1930, P. W. Oman; 2, Marion Jct., July 16, 1930, L. D. Tuthill; 2, Prattsville, July 21, 1930, R. H. Beamer; 1, Tuskegee, July 22, 1930, P. W. Oman and 1, Montgomery, July 1, 1939, R. H. Beamer. (Mississippi) 2, Shuqualak, July 16, 1930, R. H. Beamer; 1, Fulton, July 14, 1930, L. D. Tuthill; 2, Fulton, July 14, 1930, R. H. Beamer; 4, Columbus, July 16, 1930, R. H. Beamer; 1, Columbus, July 16, 1930, P. W. Oman; 1, Columbus,

July 16, 1930, L. D. Tuthill and 2, Hamilton, July 15, 1930, L. D. Tuthill. (Louisiana) 5, Nachitoches Parish, Aug. 16, 1928, R. H. Beamer; 1, Caddo Parish, Aug. 19, 1928, L. D. Beamer and 1, Beauregard Parish, Aug. 16, 1928, E. I. Beamer. (Tennessee) 3, Clarksville, Oct. 8, 1914.

Host Plants: Ball (1932) writes "The writer found it fairly common on *Ceanothus americanus* at Sanford, Florida."

Comparative Notes: This is one of the commonest species found in the Southeast. The entire face is marked, but the clypeus is lighter than the margins of the genae, separating it from *triangularis*, and it is much darker than *cinereus*. It may be found as far north as New Jersey. The genitalia are variable but the long, slender paraphyses, "L"-shaped aedeagus and long process on style readily separate it from any other. The frons of the Florida species are much lighter than those from further north.

73. *Scaphytopius (Cloanthanus) triangularis* DeLong

Cloanthanus triangularis, DeLong, D. M., Ohio Jour. Sci., XLV: p. 27, 1945.

Resembles *acutus* but with dark face and paraphyses enlarged near apex. Length: female 4.8 mm., male 4.2 mm.

Color: Crown mottled brown and light, often darkest on disc, with light markings as follows: thin line along anterior margin; wedge; irregular vittae on disc, either straight or arcuate; irregular area before eyes; typical light spots along posterior margin. Pronotum slightly lighter than crown, heavily irrorate with dark, vittae usually visible. Scutellum lighter than pronotum with typical markings. Face fulvous irrorate with dark, excepting wedge, vitta behind eye and shorter ones near ocelli and antennae. Forewing semihyaline fulvous with light aerole and fuscous vermiculations throughout; veins brown, becoming fuscous on apex and costal margin.

Structural Characteristics: Crown about twice as long as width between eyes, anterior margin straight on each side of pointed apex; wedge about half length of crown. Pronotum three-fifths as long as crown, two and one-third times as wide as length at middle and three and one-half times length behind eyes. Clypeus over twice as long as width at ocelli, shallow concavity along sharksmouth, only slightly sinuate at antennae. Clypellus only slightly enlarged near apex. Face in lateral view concave between anterior margin of eyes. Forewing with vein-like marks in brachial cell, about ten recurved veins to costa and sometimes extra cross-veins in clavus.

Genitalia: Valve about one and two-fifths as wide as length at middle, posterior margin rounded; anterior margin with short, broad, median lobe. Paraphyses with slight enlargement at base, and somewhat enlarged just before sharp apices. Aedeagus in lateral view slightly curved, largest just before middle, bluntly pointed. Styles almost three times as long as basal width, sinuate near basal third, lobe on dorsal margin before slightly curved, finger-like process on apical third.

Last ventral segment of female with lateral margins short, posterior margin almost straight on each side of blunt apex.

Types: Types in Illinois Natural History Survey collection, Urbana, Illinois. One ♂ paratype was on hand for study.

Additional Material Studied: (Kansas) Douglas Co. and Leavenworth Co. (Illinois) Union Co. (Indiana) Gary and Tippecanoe Co. (Tennessee) Clarksville. (Maryland) Annapolis. (South Carolina) Charleston. (Mississippi) Meridian, Lincoln Co. and Tishomingo Co. (Alabama) Prattsville, Etowah Co. and Tuskegee. (Florida) La Belle and Ft. Mead.

Host Plants: The original description gave *Crataegus* sp. as the host. Specimens from Etowah Co., Ala., were labeled as from *Prunus angustifolia* and the author has collected the species in Kansas from rose.

Comparative Notes: The dark brown face separates this species from most, since it has a shorter, broader crown than *rubellus*.

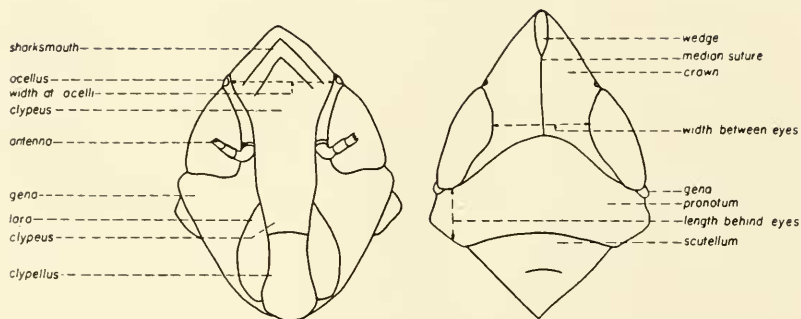
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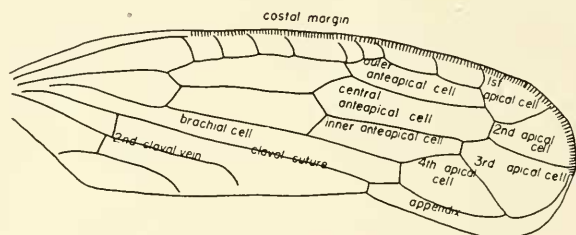
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PLATE XXIII

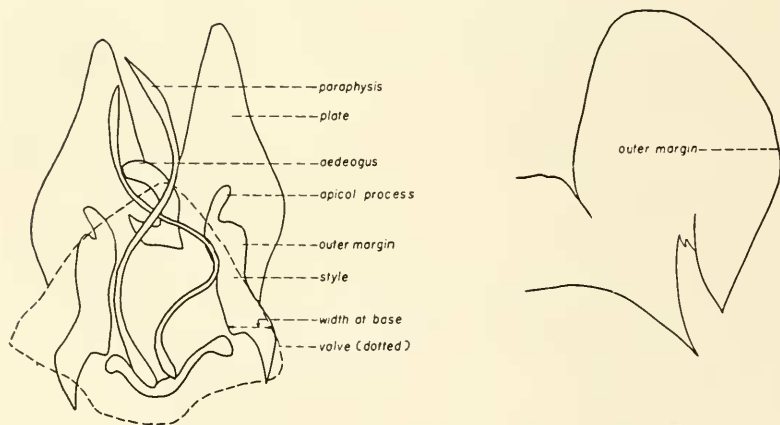


VENTRAL VIEW- HEAD

DORSAL VIEW- HEAD, PRONOTUM and SCUTELLUM



FOREWING



GENITALIA- VENTRAL VIEW

PYGOFER

SCAPHYTOPIUS (CLOANTHANUS) ANGUSTATUS (OSBORN)

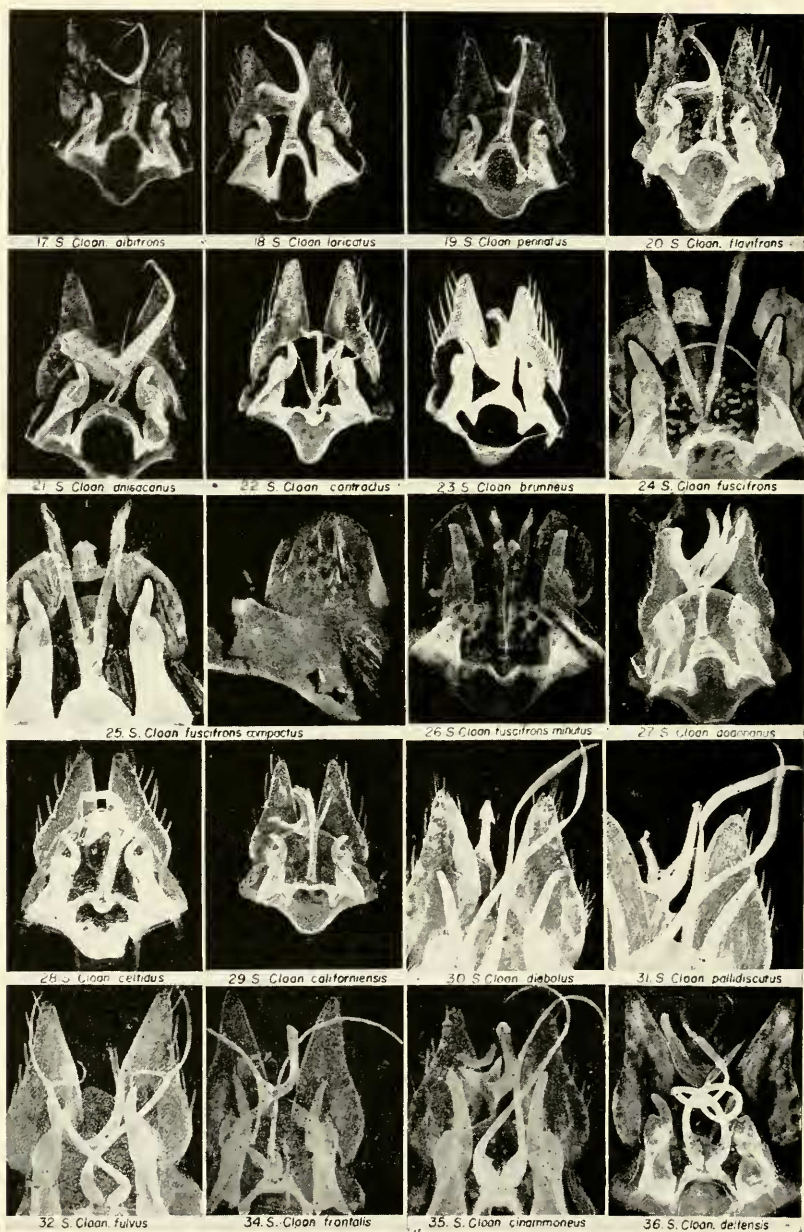
Scaphytopius (Cloanthanus) angustatus (Osborn).

PLATE XXIV



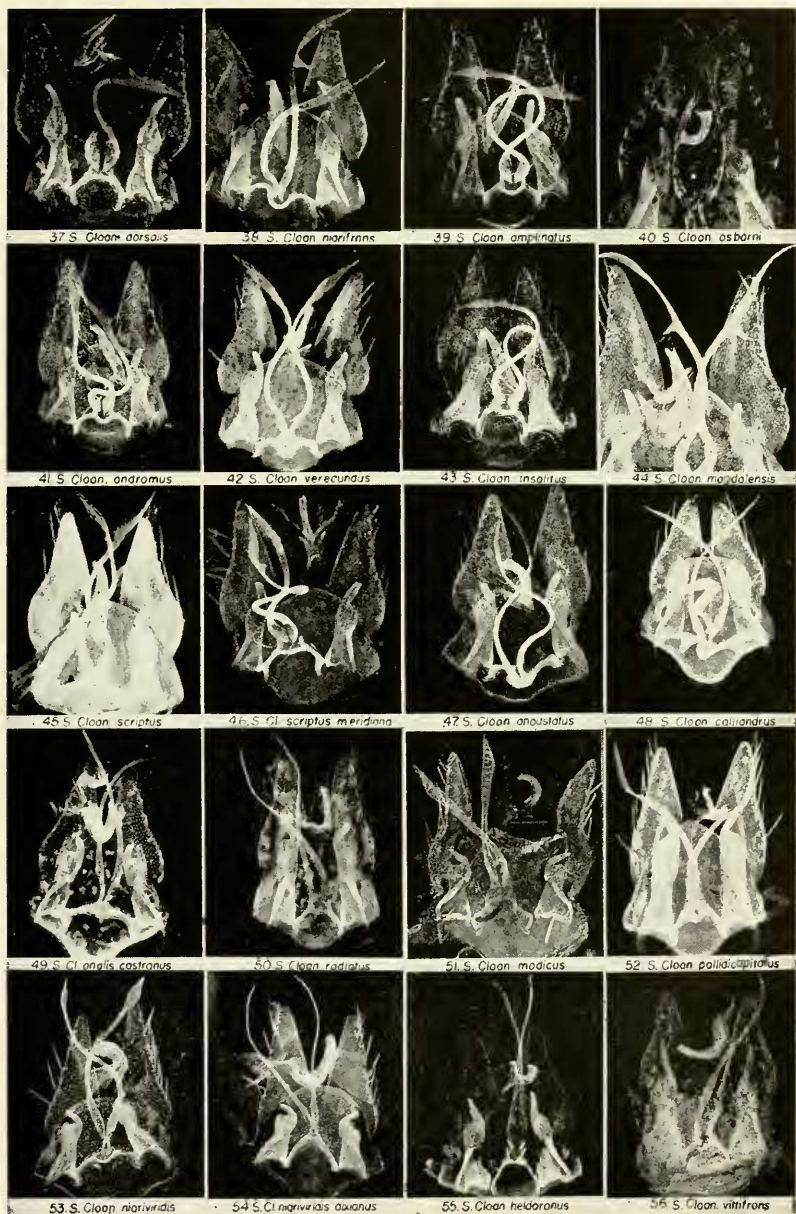
Male genitalia of the Scaphytopini.

PLATE XXV



Male genitalia of the Scaphytopini.

PLATE XXVI



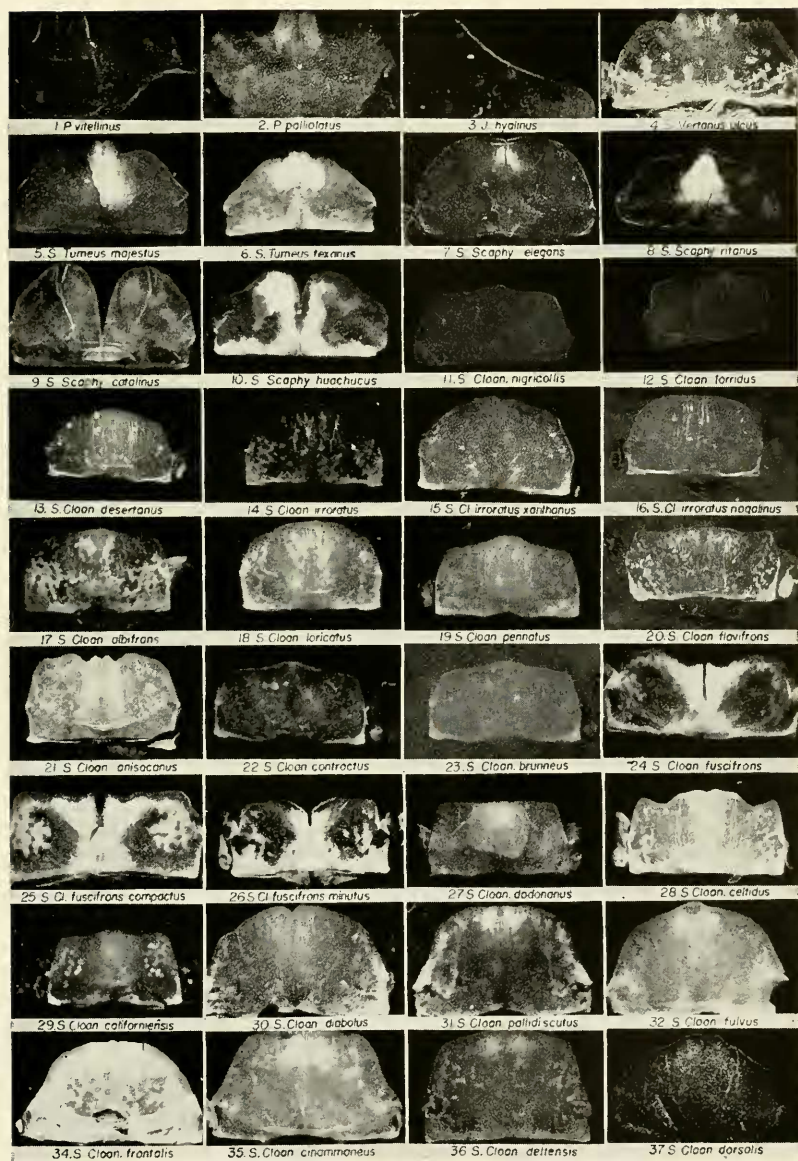
Male genitalia of the Scaphytopini.

PLATE XXVII



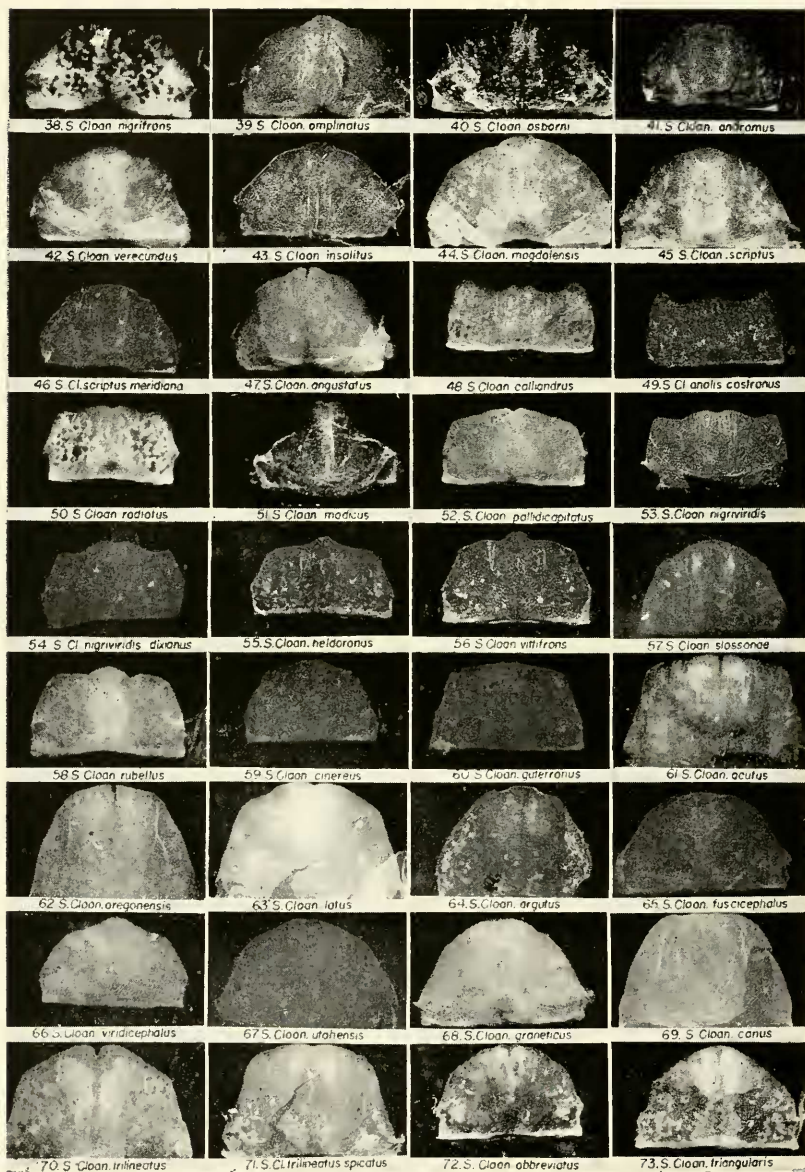
Male genitalia of the Scaphytopini.

PLATE XXVIII



Female genitalia of the Scaphytopini.

PLATE XXIX



Female genitalia of the Scaphytopini.

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